Differences Between Nylon and PTFE Syringe Filters - Tech Information

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Overview

There is frequent confusion in the field regarding which membrane—PTFE or nylon—should be used for a given solvent or analytical application. Despite both being common membrane choices, they behave very differently.

- PTFE is known for its broad chemical resistance but can contain more extractables.
- Nylon is recognized for being low in extractables, hydrophilic, and ideal for many HPLC and dissolution applications.

Choosing the wrong membrane can lead to analytical issues such as ghost peaks, membrane failure, swelling, or sample loss.

PTFE Membranes: High Chemical Resistance

PTFE membranes are widely used when durability against harsh solvents is required.

Key Characteristics

- Extremely high chemical resistance, including strong acids, strong bases, and non-polar solvents
- Hydrophobic by nature
- May contain higher levels of extractables, especially before conditioning
- Often not ideal for aqueous solutions unless pre-treated

Extractables Behavior

PTFE membranes typically release extractables during the first few milliliters of filtration. Even after discarding 2–3 mL, some extractables may remain depending on the manufacturer and membrane preparation process. High-purity applications may require additional conditioning.

Use With Aqueous Solutions

Because PTFE is hydrophobic:

- Water-based solutions may not pass easily
- Substantial hand pressure may be needed
- Pre-wetting with methanol is recommended to allow proper flow

Some manufacturers add surfactants to improve water compatibility. This can help filtration but may introduce elutable surfactants—not appropriate in sensitive analytical work.

Best Uses for PTFE

- Strong acids and bases
- Non-polar solvents
- Most organic solvents
- Harsh chemical environments

Normal-phase chromatography systems

Nylon Membranes: Low Extractables & Broad Compatibility

Nylon is one of the most commonly selected membranes for HPLC sample preparation due to its balance of chemical compatibility and purity.

Key Characteristics

- Naturally hydrophilic—ideal for aqueous solutions
- Very low extractables, making it excellent for HPLC and dissolution testing
- Compatible with many organic solvents
- Mechanically strong with consistent pore structure

Solvents to Avoid With Nylon

Some solvents can cause nylon membranes to:

- Swell
- Weaken
- Lose structural integrity
- Burst or rupture

Avoid using nylon with:

- Strong acids
- Strong bases
- Aldehydes
- Ketones
- Certain aggressive organic solvents

For solutions compatible with nylon—including most HPLC mobile phases—nylon provides one of the cleanest filtrates available.

Best Uses for Nylon

- Aqueous solutions
- Many buffers and mobile phases
- HPLC/Dissolution sample preparation
- Samples requiring minimal extractables
- General lab filtration where purity is important

Side-By-Side Summary

Property	Nylon	PTFE

Hydrophilicity	Hydrophilic	Hydrophobic
Extractables	Very low	Higher (varies by supplier)
Chemical Resistance	Good but limited	Excellent, very broad
Aqueous Compatibility	Excellent	Requires pre-wetting or surfactants
Organic Solvent Compatibility	Many	Almost all
Best For	HPLC, dissolution, aqueous samples	Harsh chemicals, non-polar solvents

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Choosing the Right Membrane

Selecting nylon or PTFE depends on:

- Solvent type
- Method sensitivity
- Required purity
- Filtration volume
- Aqueous vs. organic composition

Understanding the chemical and mechanical behavior of each membrane ensures accurate, reproducible filtration for analytical work.

Ordering Information

For AQ™ nylon and PTFE syringe filter catalog numbers, specifications, and images: Click ***HERE*** for AQ syringe filters orde ring information and pictures.

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