Ultradyne® Filter Cartridge

The Ultradyne® filter cartridge is an absolute rated, pleated PTFE membrane cartridge which offers the greatest assurance of filtration performance and chemical compatibility in severe process conditions. Available in absolute retention ratings of 0.05 μm, 0.1 μm, 0.2 μm, 0.4 μm, 1.0 μm and 5.0 μm, the Ultradyne® filter is designed for the utmost security in aggressive solvents, highly corrosive chemicals and gases.

Constructed entirely of PTFE and polypropylene materials, the Ultradyne® cartridge is an inert, chemically pure filter. Its filtration media is a highly porous PTFE membrane, which provides high flow rates and long service life. A unique, state-of-the-art process thermally bonds the filter and polypropylene support components to the cartridge end caps. This results in an integral filter cartridge which provides maximum chemical compatibility with minimal extractables.

Features and Benefits
- Inert PTFE and polypropylene components provide extremely wide chemical compatibility, and permit use in a broad range of fluids and applications
- Absolute ratings of 0.05, 0.1, 0.2, 0.4, 1.0 and 5.0 micron deliver precise particle retention at rated level
- Highly porous PTFE membrane assures high flow rates, long service life and maximum chemical resistance with minimum extractables
- Inherently hydrophobic membrane provides a natural barrier to water without the use of additives or surface modifying agents which can leach or wash out
- Rugged thermal bonded construction ensures reliable integrity under severe process conditions and withstands multiple sterilizations
- Contains no binders or adhesives for wide solvent compatibility with extremely low extractables
- Fully integrity testable for assured product integrity and effectiveness in operation
- 100% integrity testing by factory guarantees product reliability and consistency
- Biologically inert and non-toxic - Ultradyne® meets FDA requirements for food contact use and is biosafe in compliance with USP Class VI biological reactivity tests

Typical Applications
Ultradyne® meets the critical demand for contamination control in the chemical, microelectronics, aerospace, biologicals, pharmaceuticals, food and beverage, and other industries. The Ultradyne® cartridge is designed for the removal of particulates, colloids and microorganisms from aggressive solvents, highly corrosive chemicals and gases. It is ideal for bulk and point-of-use filtration.

Typical chemicals include:
- Highly concentrated acids
- Bases
- Alcohols
- Chlorinated and fluorinated solvents
- Esters
- Ketones
- Photoresists
- Etchants
- Photolithographic solutions

For aqueous solutions, the Ultradyne® filter must be pre-wet by immersion in a suitable low surface tension fluid.

The inherently hydrophobic Ultradyne® filter is ideal for gas filtration applications that include:
- Compressed air
- Fermentation air
- Pressurized gases
- Tank venting

Ultradyne® SEM
Materials of Construction
Filter Media: Polytetrafluoroethylene (PTFE)
Upstream Support: Polypropylene
Downstream Support: Polypropylene
Core/Outer Guard: Polypropylene
End Caps: Polypropylene
Sealing Method: Thermal Bonding
O-ring/Gasket Seal: Buna, EPR, polyethylene, silicone, Teflon® over silicone, Teflon® over Viton®

All materials of construction listed above meet FDA standards for food contact per 21 CFR 177.

Filters comply with European Commission Regulation No. 10/2011. Ultradyne® filters meet the requirements as specified in the current USP Class VI plastics, pyrogen and cytotoxicity tests. No binders, adhesives or surfactants are used in the construction of Ultradyne® filters. Ultradyne® filters are non-fiber-releasing as defined in 21 CFR 210.3(b)(6) and 211.72.

Filtration Ratings
Filter Grade | Absolute Ratings (μm)
--- | ---
TM | 0.05, 0.1, 0.2, 0.4, 1.0, 5.0
TA/TT | 0.2
TD | 0.1, 0.2

Integrity Testing
Minimum Bubble Point, 60% IPA
TM
0.1 μm | 20 psi (1.4 bar)
0.2 μm | 14 psi (1.0 bar)
0.4 μm | 7 psi (0,5 bar)
1.0 μm | 4 psi (0,3 bar)
TA/TT
0.2 μm | 16 psi (1,1 bar)

Typical water flow rates per 10” cartridge

Typical air flow rates per 10” cartridge

Bacterial Retention
ASTM FB38-05 Challenge
TA 0.2 μm and TT 0.2 μm > 10⁷ cfu/cm²
Brevundimonas diminuta
(TA 0.2 μm and TT 0.2 μm meet the FDA definition of a liquid rated sterilizing grade filter.)
TM 0.4 μm > 10⁷ cfu/cm² Serratia marcescens

Sterilization
Steam-in-place (SIP):
saturated steam @ 121-135 °C, 30-60 minutes
[15-30 psi (1-2 bar), 30-60 minutes]
Autoclave: 121-125 °C, 30-60 minutes

Ultradyne® cartridges are capable of repeated sterilization cycles without loss of integrity. For applications requiring autoclave/SIP, a stainless steel reinforcement ring must be ordered. See “Reinforcement Ring Option” within the ordering information.

Maximum Operating Temperatures and Pressures
\(\Delta p\) 80 psi @ 32 °F to 100 °F (\(\Delta p\) 5,5 bar @ 0 °C to 38 °C)
\(\Delta p\) 60 psi @ 150 °F (\(\Delta p\) 4,1 bar @ 66 °C)
\(\Delta p\) 30 psi @ 180 °F (\(\Delta p\) 2,1 bar @ 82 °C)

Cartridge Dimensions (nominal)
Diameter: 2.75” (7 cm)
Length: 10”, 20”, 30”, 40”
(25 cm, 50 cm, 75 cm, 100 cm)
End Cap Configurations

Filter Grade Descriptions
TM = This absolute, particulate rated filter is 100% integrity tested during manufacture. It is suited for high purity filtration of liquids, or for economical sterilization of air/gas when regulatory requirements are minimal. A Certificate of Conformance is available on a lot basis.

TT = This absolute, microbiologically rated, sterilizing grade filter meets full traceability requirements for the pharmaceutical industry. It is 100% integrity tested during manufacture. Each TT grade filter is shipped with a Certificate of Quality stating exact quality control criteria and test performance results. This is a validatable product to meet the stringent requirements of the pharmaceutical industry.

TA = This sterilizing grade filter is absolute, microbiologically rated and 100% integrity tested during manufacture. (It qualifies as a sterilizing grade filter per ASTM F838 liquid bacterial challenge.) It is suited for critical applications when regulatory documentation requirements are minimal. A Certificate of Conformance is available on a lot basis.

TD = This absolute, particulate rated, double layer filter is 100% integrity tested during manufacture. It is suited for applications when regulatory documentation requirements are minimal. A Certificate of Conformance is available on a lot basis.

Ordering Information

<table>
<thead>
<tr>
<th>Filter Grade</th>
<th>Absolute Rating (μm)</th>
<th>Cartridge Length</th>
<th>End Cap Configuration</th>
<th>Reinforcement Ring Option</th>
<th>Seal Material (O-ring or Gasket)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM</td>
<td>0.2</td>
<td></td>
<td></td>
<td></td>
<td>R = Reinforcement ring; required for autoclave/SIP applications</td>
</tr>
<tr>
<td>TM</td>
<td>0.05, 0.1, 0.2, 0.4, 1.0, 5.0</td>
<td>1 = 10&quot; (25 cm)</td>
<td>GS = DOE; flat gaskets (8.75&quot;, 19.5&quot;, 29.25&quot;, 39&quot; length filters)</td>
<td></td>
<td>O-ring Seal</td>
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<tr>
<td></td>
<td></td>
<td>2 = 20&quot; (50 cm)</td>
<td>GL = DOE; flat gaskets (20&quot;, 30&quot;, 40&quot; length filters)</td>
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<td>B = Buna</td>
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<td></td>
<td></td>
<td>3 = 30&quot; (75 cm)</td>
<td>C1 = SOE; -222 nO-Ring®, button cap end</td>
<td></td>
<td>E = EPR</td>
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<tr>
<td></td>
<td></td>
<td>4 = 40&quot; (100 cm)</td>
<td>C2 = SOE; -222 O-rings, button cap end</td>
<td></td>
<td>S = Silicone</td>
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<tr>
<td>TT</td>
<td>0.2</td>
<td></td>
<td>F1 = SOE; -222 nO-Ring®, fin end</td>
<td></td>
<td>T = Teflon® over silicone</td>
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<tr>
<td>TA</td>
<td>0.2</td>
<td></td>
<td>F2 = SOE; -222 O-rings, fin end</td>
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<td>V = Viton®</td>
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<tr>
<td>TD</td>
<td>0.1, 0.2</td>
<td></td>
<td>C5 = SOE; -226 nO-Ring®, button cap end</td>
<td></td>
<td>X = Teflon® over Viton®</td>
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<td></td>
<td></td>
<td></td>
<td>C6 = SOE; -226 O-rings, button cap end</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>F6 = SOE; -226 O-rings, fin end</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>DN = DOE; internal -120 O-rings</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>RN = SOE; internal -120 O-ring, recessed cap end</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>DA = DOE; internal -213 O-rings</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>RA = SOE; internal -213 O-ring, recessed cap end</td>
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<td></td>
</tr>
</tbody>
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