

# NanoSHIELD<sup>®</sup> S Series

Filter Capsules

NanoSHIELD S Series filter capsules deliver enhanced protection by providing high capacity contaminant retention and long filter lifetime for most chemical applications. Utilizing Hollow Fiber Technology (HFT), NanoSHIELD is able to deliver up to 3 times more filtration surface area as compared to an equivalent sized pleated filter. This translates into significantly higher flow rates and lower pressure drop, while maintaining the highest level of filter efficiency in a small compact design. NanoSHIELD S Series filter capsules come in four removal ratings (0.01, 0.02, 0.05, 0.1 micron) as well as a pre-wet version to reduce installation time when used in aqueous based fluids.

## High Flow Rates, Lower Total Cost

A single NanoSHIELD LDC 10" filter capsule rated at 0.02 micron can replace one standard 20" pleated filter capsule rated at 0.02 micron. Increasing flow rates while maintaining filter efficiency provides for faster bath clean-up, reduced pump wear, and lower energy consumption.



## Features & Benefits

### Large Surface Area with Hollow Fiber Technology.

- Up to 3 times more surface area as compared to equivalent sized capsules.
- Higher flow rates, lower pressure drop, and 2-3 times longer life.
- High contaminant holding capacity.
- Increased filtration performance in high viscosity fluids.
- Reduces hold-up volume and "dead space" by eliminating the filter core.

### Polypropylene and Polyethylene Construction.

- Robust material provide good chemical resistance for most chemicals.
- No pre-wetting required for solvent based chemicals.

### 0.01 µm and 0.02 µm Retention Ratings.

- Superior removal of particles, gels, and micro-bubbles.

### Pre-Wet Option.

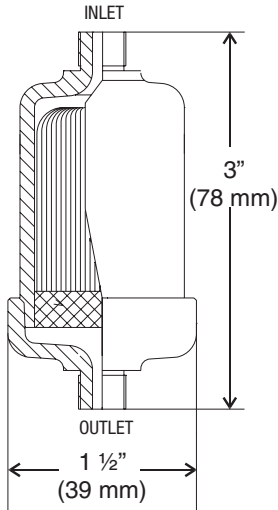
- Reduces time consuming pre-wetting procedures for aqueous based chemical.

### Quality Manufacturing.

- Manufactured in a cleanroom to reduce particle adders and extractables.
- All filters are cleaned and integrity tested to ensure reliability.

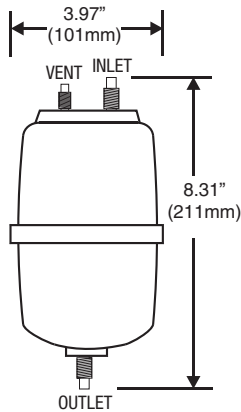
## Applications

Anti-Reflective Coatings	Alcohols
Color Filter	Bases
Glass Substrates	Developers
Parts Cleaning	High Viscosity Fluids
Photoresists	Ink Jets
Polyimide	Process Water
Resins	Solvents

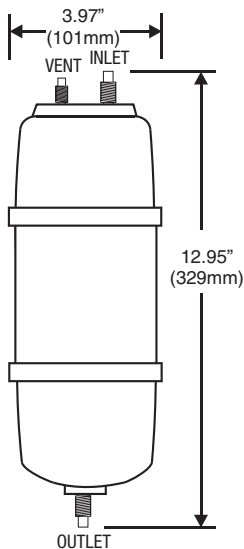


NanoSHIELD S Series SDC Capsule

### 5 Inch LDC



### 10 Inch LDC



NanoSHIELD S Series LDC Capsule

## Less Handling, Increased Cleanliness

NanoSHIELD® S Series filter capsules are disposable thereby eliminating the need to handle the filter element which is a leading cause of process contamination. The hollow fiber polypropylene membrane in an all polyethylene construction provides low extractables and good chemical resistance with most chemicals. All filters are integrity tested and rinsed with high purity water to provide fast start-up times out of the box.

## Peak Performance in High Viscosity Fluids

Up to three times more surface area than similar sized pleated filter capsules allows NanoSHIELD S Series a lower pressure drop and increased contact or residence time with high viscosity fluids like polyimide. Maximizing surface area reduces recirculation time, while increased contact time improves filtration efficiency.

## Small Compact Design

The small compact design minimizes exposure to hazardous or corrosive fluids, lowers hold-up volume, requires less space for filter change-out, and reduces downtime.

## Cost-Effective Filtration

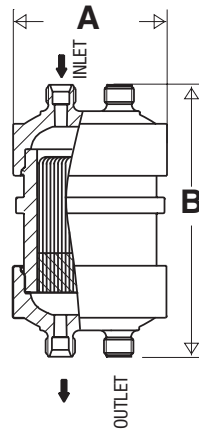
When compared to pleated filter capsules, NanoSHIELD S Series filters with HFT provide flow rates up to 3 times higher which allows for reduced footprint systems with lower hold-up volumes or equivalent sized filter systems with vastly superior lifetime. Either way the result is the same – NanoSHIELD S Series filters deliver a lower cost-of-ownership.

## Wide Breadth of Products

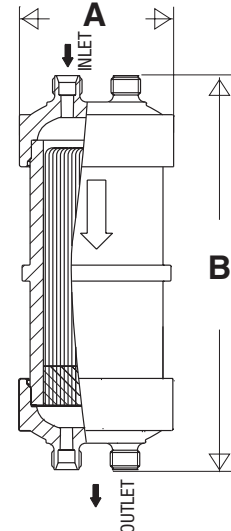
NanoSHIELD S Series filter capsules are offered in five different sizes allowing the end user to match a specific flow rate or batch size with the proper filter to minimize cost.

End Fitting	5" MDC		3" MDC	
	A	B	A	B
Swagelok	2.28"	5.81"	2.28"	3.88"
Flowell	(58 mm)	(147.6 mm)	(58 mm)	(98.5 mm)
		7.08"		5.15"
		(180 mm)		(130.8 mm)

### 3 Inch MDC



### 5 Inch MDC

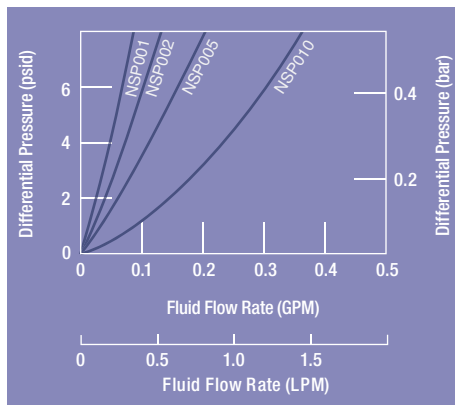


NanoSHIELD S Series MDC Capsule

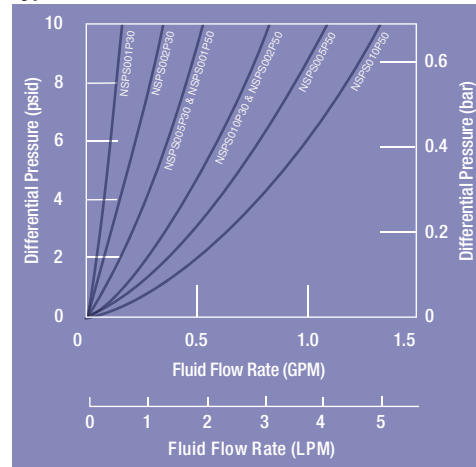
**NanoSHIELD S Series Specifications**

Membrane Material	Hydrophobic Hollow Fiber Polypropylene
Capsule Body Material	Polyethylene – SDC and MDC Polypropylene – LDC
Potting Material	Polyethylene
O-Ring Material – LDC Only	Fluorocarbon Encapsulated PTFE (FEP)
Filtration Surface Area	SDC – 148.8 in <sup>2</sup> (960 cm <sup>2</sup> ) MDC 3" – 1.8 ft <sup>2</sup> (1700 m <sup>2</sup> ) MDC 5" – 4.1 ft <sup>2</sup> (3800 m <sup>2</sup> ) LDC 5" – 10.8 ft <sup>2</sup> (1.0 m <sup>2</sup> ) LDC 10" – 23.7 ft <sup>2</sup> (2.2 m <sup>2</sup> )
Maximum Operating Pressure	58 psig (4.0 bar)
Maximum Operating Temperature	104°F (40°C)
Absolute Removal Ratings (µm)	0.01, 0.02, 0.05, and 0.1
Filter Capsule Integrity	100% Tested

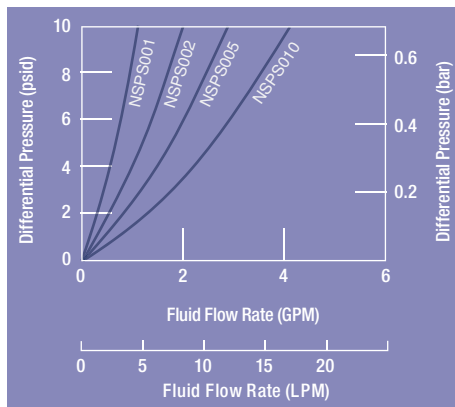
**Graph 1: NanoSHIELD S SDC Capsule Typical Flow Rates**



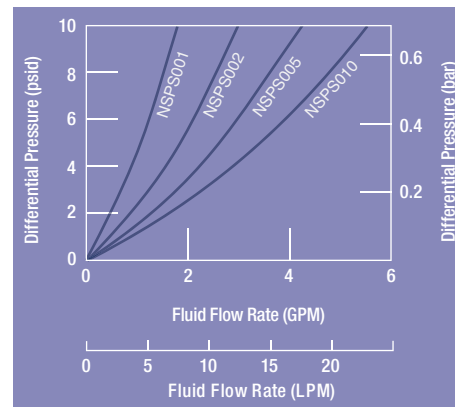
**Graph 2: NanoSHIELD S LDC 5" Capsule Typical Flow Rates**



**Graph 1: NanoSHIELD S LDC 5" Capsule Typical Flow Rates**



**Graph 1: NanoSHIELD S LDC 10" Capsule Typical Flow Rates**



# NanoSHIELD® Filter Capsules Ordering Guide

## NanoSHIELD SDC Filter Capsules

Polypropylene Capsule Media	Removal Rating	Configuration	Length	Fitting Connection	Wetting Option*
NSPS	001 - 0.01 µm 002 - 0.02 µm 005 - 0.05 µm 010 - 0.1 µm	N - SDC	20 - 2"	J - 1/8" NPT	W - Pre-wet  * leave blank if not required

Example – A 0.01 micron NanoSHIELD SDC Capsule with 1/8" NPT fittings would be NSPS001N20J.

## NanoSHIELD MDC Filter Capsules

Polypropylene Capsule Media	Removal Rating	Configuration	Length	Fitting Connection	Wetting Option*
NSPS	001 - 0.01 µm 002 - 0.02 µm 005 - 0.05 µm 010 - 0.1 µm	P - MDC	30 - 3" 50 - 5"	F - 1/4" Swagelok® G - 1/4" Flowell® Series 60	W - Pre-wet  * leave blank if not required

Example – A Pre-wet 0.02 micron NanoSHIELD MDC 5" Capsule with 1/4" Swagelok fittings would be NSPS002P50FW.

## NanoSHIELD LDC Filter Capsules

Polypropylene Capsule Media	Removal Rating	Configuration	Length	Fitting Connection	Wetting Option*
NSPS	001 - 0.01 µm 002 - 0.02 µm 005 - 0.05 µm 010 - 0.1 µm	S - LDC	50 - 5" 10 - 10"	KH - 1/2" Flowell Series 60 Inlet/Outlet Fittings with 1/4" Flowell Series 60 Vent Fitting	W - Pre-wet  * leave blank if not required

Example – A 0.05 micron NanoSHIELD LDC 10" Capsule with 1/2" Flowell fittings would be NSPS005S10KH.

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