

# Micro-Klean™ D Series Blanket Media Filter Cartridges

The Micro-Klean™ D series filter cartridge is a major advance in blanketed filter technology. By combining an enhanced open wind process with an internal media blanket, the Micro-Klean D series provides superior flow rates, greater filtration efficiency, and consistent filtration characteristics from cartridge to cartridge, lot to lot.

The superior performance is a direct result of the advanced winding pattern of the yarn matrix combined with 3M Purification process of separately applying a tailored media “blanket” between successive layers of yarn. This winding pattern creates much larger diamond shaped contaminant holding chambers. The separately inserted blanket encloses the chambers and maintains the consistency and integrity of filtration. These two factors combine to achieve a balance of filtration characteristics impossible to obtain with ordinary wound filter cartridges with teased or brushed up random fibers on the yarn to produce a filtering media.

The Micro-Klean D series winding pattern also provides less restriction than the patterns common to ordinary wound cartridges. Consequently, it is not unusual for Micro-Klean D series filter cartridge to provide up to 2.5 times more open area, enhancing the flow rate by up to 500% for the same pressure drop (see Graph 1).

Micro-Klean D series is a blanket media cartridge offering true graded density, with more open filtration on the outside of the filter and fine, more efficient filtration, on the inner layer of the cartridge. Blinding of the filtration surfaces by large particles is minimized and cartridge life extended. Lower cartridge replacement costs are achieved as demonstrated in Graph 2.

Micro-Klean D series filter cartridges, with nominal ratings from 0.5 to 350 microns, are available with various media, matrix, and core materials to ensure compatibility with your process. Standard materials include cotton yarn/cotton media blanket for use in applications involving water, alcohol, and other polar liquids. Cotton materials are CFR 21 compliant for use with potable water, food, and beverage products.

The polypropylene yarn/polypropylene media blanket configuration, also CFR 21 compliant, is excellent for use with acids, alkalis, strong oxidizing and reducing agents, and other chemicals in aqueous solutions.



## Better By Design...

- Enhanced Reduction Efficiency
- Superior Capacity for Long Life
- Wide Range of Reduction Ratings
- CFR21 Compliant Materials

## Features & Benefits

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### Blanket media filter cartridge

- Higher filtration efficiency at the selected rating

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### CFR 21 listed materials of construction

- Suitable for food & beverage, and other regulated applications

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### Graded density construction

- Very low pressure drop and high flow rates
- Longer filter life and more cost effective filtration

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### Low extractable levels

- Suitable for water, electronics and electroplating

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### Integral lengths from 9-7/8 in. to 40 in.

- Reduces joints that cause blinding or by-pass
- Easy to install and reduce

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### Choice of construction materials

- Ensures process and system compatibility

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### High dirt holding capacity

- Reduces filter change-outs

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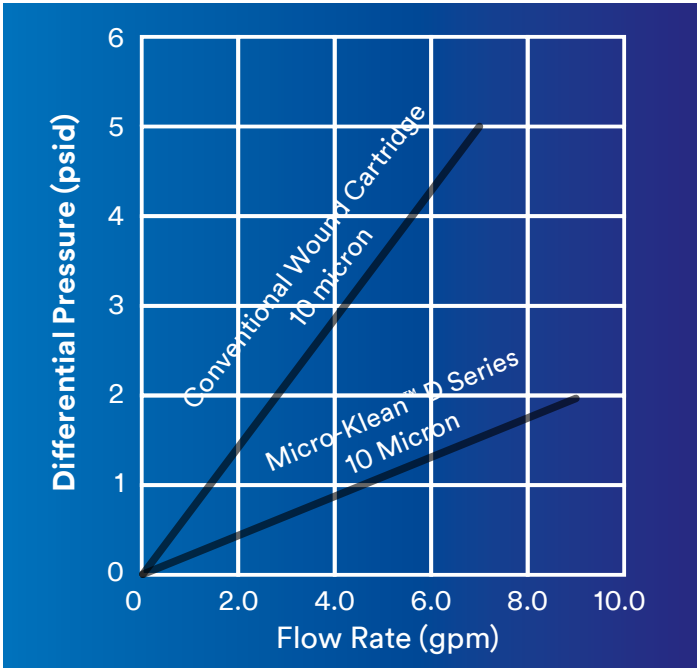
### Wide variety of end fittings

- Suitable for all filter housings

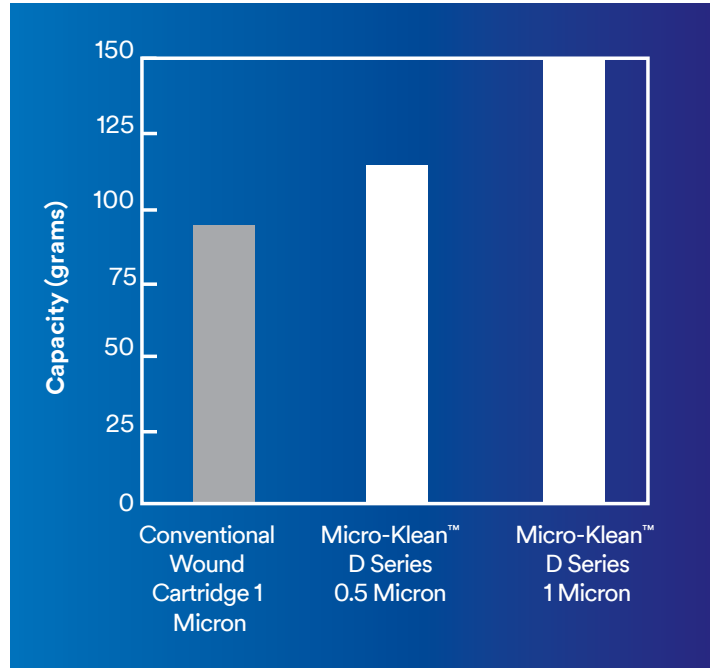
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### Cleaner, more durable construction

- Less media migration than conventional wound cartridges



Graph 1. Flow Comparison



Graph 2. Service Life



Micro-Klean™ D Series Cartridge Configurations

**Cartridge Disposal**

Micro-Klean™ D series cartridges can be incinerated or shredded when configured with polypropylene cores. Metal cores can be crushed by high pressure techniques after media incineration. Other methods may be more economical when using metal cores.

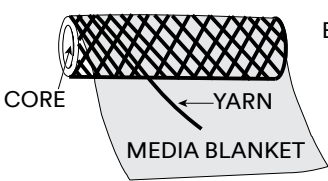
**Configurations**

Cartridges can be configured with tinned steel, stainless steel, or polypropylene cores. The use of various core materials provide an advanced range of compatibility.

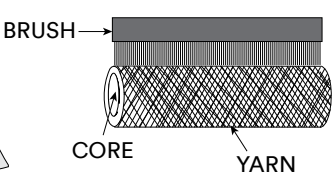
Table 1: Cartridge Comparisons

| Micron Rating  | Tinned Steel   | 304 SS Core | 316 SS Core | Polypropylene Core |
|--|----------------|-------------|-------------|--------------------|
| <b>Polypropylene Media Blanket/Yarn Cartridges (150°F)</b> |                |             |             |                    |
| 0.5  | D-FFFZ         | D-FFSZ      | D-PTZ       | D-PPPZ             |
| 1  | D-PPFY         | D-PPSY      | D-PPTY      | D-PPPY             |
| 3  | D-PPFA         | D-PPSA      | D-PPTA      | D-PPPA             |
| 5  | D-PPFB         | D-PPSB      | D-PPTB      | D-PPPB             |
| 10   | D-PPFC         | D-PPSC      | D-PPTC      | D-PPPC             |
| 25   | D-PPFF         | D-PPSF      | D-PPTF      | D-PPPF             |
| 50   | D-PPFL         | D-PPSF      | D-PPTF      | D-PPPF             |
| 75   | D-PPFQ         | D-PPSQ      | D-PPTQ      | D-PPPQ             |
| 100  | D-PPFV         | D-PPSV      | D-PPTV      | D-PPPV             |
| 350  | D-PPFW         | D-PPSW      | D-PPTW      | D-PPPW             |
| <b>Cotton Media Blanket/Yarn Cartridges</b>                |                |             |             |                    |
|  | <b>(250°F)</b> |             |             | <b>(150°F)</b>     |
| 0.5  | D-CCFZ         | D-CCSZ      | D-CCTZ      | D-CCPZ             |
| 1  | D-CCFY         | D-CCSY      | D-CCTY      | D-CCPY             |
| 3  | D-CCFA         | D-CCSA      | D-CCTA      | D-CCPA             |
| 5  | D-CCFB         | D-CCSB      | D-CCTB      | D-CCPB             |
| 10   | D-CCFC         | D-CCSC      | D-CCTC      | D-CCPC             |
| 25   | D-CCFF         | D-CCSG      | D-CCTF      | D-CCPF             |
| 50   | D-CCFL         | D-CCSL      | D-CCTL      | D-CCPL             |
| 75   | D-CCFQ         | D-CCSQ      | D-CCTQ      | D-CCPQ             |
| 100  | D-CCFV         | D-CCSV      | D-CCTV      | D-CCPV             |
| 350  | D-CCFW         | D-CCSW      | D-CCTW      | D-CCPW             |

## Micro-Klean™ D Series Blanket Media Filter Cartridges

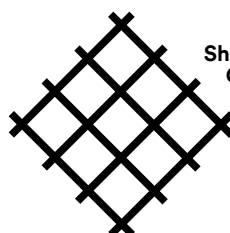


**Micro-Klean™ D Series**

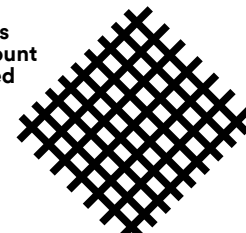


**Conventional Wound**

**Equal Areas Showing Amount Of Yarn Used**



Micro-Klean™ D Series  
2.25 sq. in.  
Open Flow Area



Conventional Cartridge  
0.99 sq. in.  
Open Flow Area

The Micro-Klean™ D series media blanket is superior to the brushing method of conventional wound cartridges that breaks the yarn fibers resulting in media migration. The media blanket produces greater filtration efficiency, increased contaminant holding capacity, and substantially cleaner filtration.

The Micro-Klean™ D series winding pattern combined with the media blanket produces a more rigid structure and reduces the restriction caused by the yarn. This results in an enhanced flow of up to 500%, in turn reducing the size and cost of filtration hardware!

Table 1 lists the various configurations for Micro-Klean™ D series filters. 3M Micro-Klean D series cartridges can be configured with various end-treatments and O-ring materials to fit competitive filter housings (see Ordering Guide).

### Cartridge Flow Rates

**Aqueous Flow Rates** — Micro-Klean D series cartridges exhibit excellent flow performance. For good filter practice, the flow values listed in Table 2, by grade designation, are recommended for maximum service life.

**Non Aqueous Flow Rates** — Calculate using the formula in conjunction with the values shown in Table 3. The specific pressure drop values may be effectively used when three of the four variables (Viscosity, Flow, Differential Pressure, and Cartridge Grade) are set.

$$\text{Clean } \Delta p \text{ (psi (mbar))} = \frac{\left( \text{total system gpm [lpm]} \right) \left( \text{viscosity in cst} \right) \left( \text{value from table} \right)}{\left( \text{Number of Equivalent Single Length Cartridges in housing} \right)}$$

**Table 2: Aqueous Rates**

| Grade         | Flow Rate *(gpm) |
|---------------|------------------|
| Z             | 2                |
| Y             | 2                |
| A             | 3                |
| B, C          | 4                |
| F, L, Q, V, W | 5                |

\* Flow rates are for single length cartridges (9-7/8 in. – 10 in.).

**Table 3: Micro-Klean™ D Series Flow Rates**

| Grade | Nominal Rating (µm) | Specific Pressure Drop per 10" Cartridge * |              |              |              |
|-------|---------------------|--|--------------|--------------|--------------|
|       |                     | Polypropylene Media                        |              | Cotton Media |              |
|       |                     | psid/gpm/cst                               | mbar/lmp/cst | psid/gpm/cst | mbar/lmp/cst |
| Z     | 0.5                 | 0.21                                       | 3.84         | 0.62         | 11.20        |
| Y     | 1                   | 0.14                                       | 2.55         | 0.47         | 8.62         |
| A     | 3                   | 0.10                                       | 1.86         | 0.39         | 7.10         |
| B     | 5                   | 0.04                                       | 0.71         | 0.17         | 3.12         |
| C     | 10                  | 0.03                                       | 0.49         | 0.08         | 1.49         |
| F     | 25                  | 0.02                                       | 0.33         | 0.05         | 0.93         |
| L     | 50                  | 0.010                                      | 0.19         | 0.03         | 0.47         |
| Q     | 75                  | 0.008                                      | 0.15         | 0.013        | 0.24         |
| V     | 100                 | 0.005                                      | 0.10         | 0.011        | 0.20         |
| W     | 350                 | 0.004                                      | 0.08         | 0.006        | 0.11         |

\* Specific pressure drop at ambient temperature for a single length equivalent (10") cartridge. Table values are shown for liquids with kinematic viscosity equal to 1.0. Kinematic viscosity in centistokes (cst) can be calculated by dividing the viscosity in centipoise by the specific gravity of the fluid. For multiple cartridge lengths, divide the total flow by the number of equivalent lengths.

# Micro-Klean™ D Series Ordering Guide

| Basic Catalog Number   | Media Blanket                                 | Matrix  | Core Material   | Grade Designation |                     | Nominal Cartridge Length |         | End Modification*   | O-ring Material   |
|--|---|---|---|-------------------|---------------------|--------------------------|---------|---|---|
|  |   |   |   | Grade             | Nominal Rating (µm) | Code                     | Length  |   |   |
| <b>D</b> – No Extended Core<br><b>S</b> – 316 S.S. Extended Core<br><b>P</b> – Polypropylene Extended Core | <b>C</b> – Cotton<br><b>P</b> – Polypropylene | <b>C</b> – Cotton<br><b>P</b> – Polypropylene | <b>P</b> – Polypropylene<br><b>F</b> – Tinned Steel<br><b>S</b> – 304 S.S.<br><b>T</b> – 316 S.S. | Z                 | 0.5                 | 1**                      | 9-7/8"  | <b>C</b> – Code 8 Double O-Ring Connector & Spear<br><b>F</b> – Code 3 Double O-Ring Connector & Flat Cap | <b>A</b> – Silicon<br><b>B</b> – Fluorocarbon<br><b>C</b> – EPR<br><b>D</b> – Nitrite |
|  |   |   |   | Y                 | 1                   | 2                        | 19-1/2" |   |   |
|  |   |   |   | A                 | 3                   | 2x                       | 20"     |   |   |
|  |   |   |   | B                 | 5                   | 3                        | 29.25"  |   |   |
|  |   |   |   | C                 | 10                  | 3x                       | 30"     |   |   |
| F  | 25  | 4   | 39"   |                   |                     |                          |         |   |   |

**Option:** For voile covered core, insert the letter V before the grade designation.

\* End Modification Requires use of the polypropylene core.

\*\* Fits 9-3/4 in. and 10 in. housings.

**PLEASE NOTE: The Ordering Guide above is for reference only. Not all combinations are available.**

**Please consult with your 3M Representative to determine the appropriate part number for your application.**

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