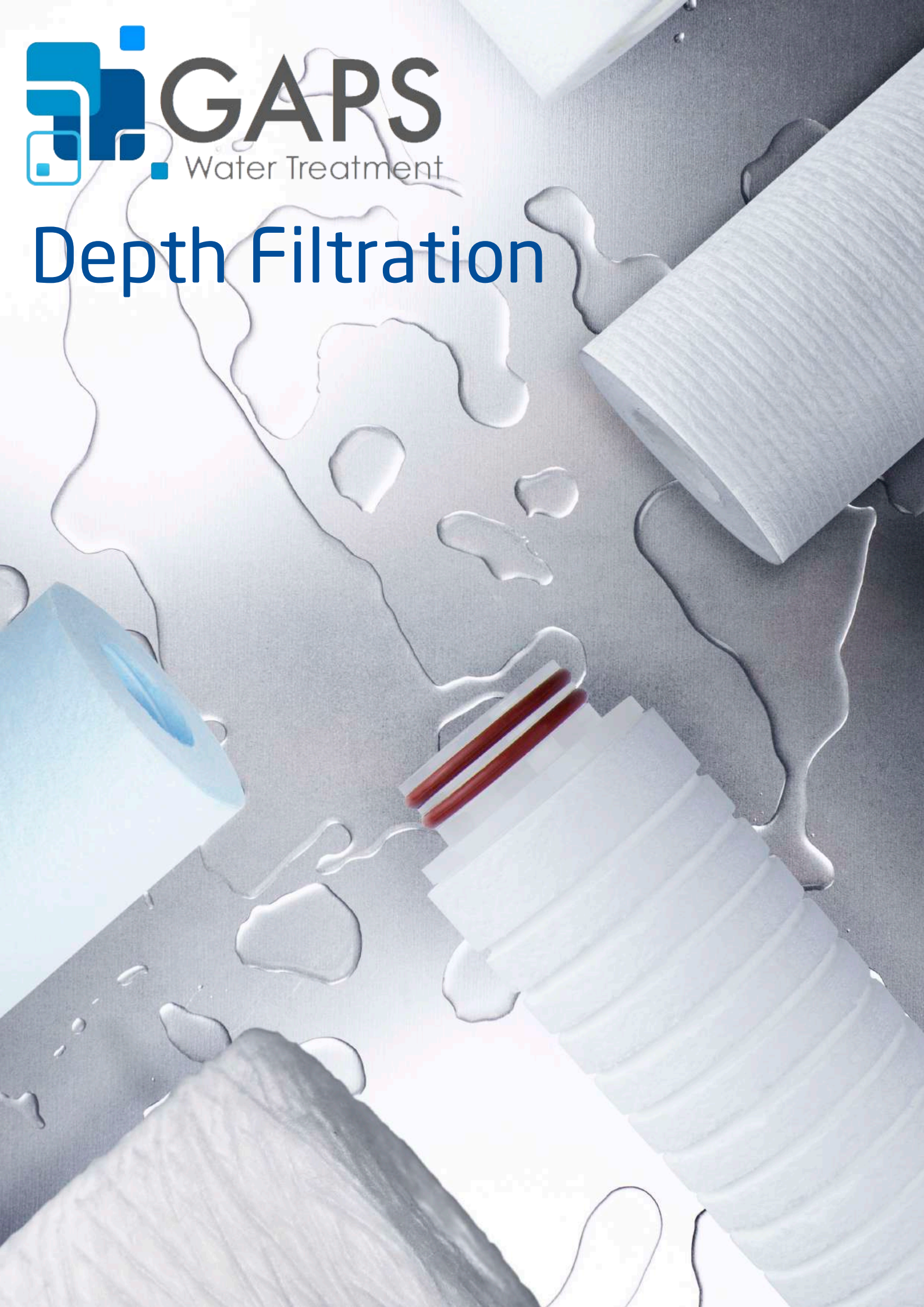




# Depth Filtration





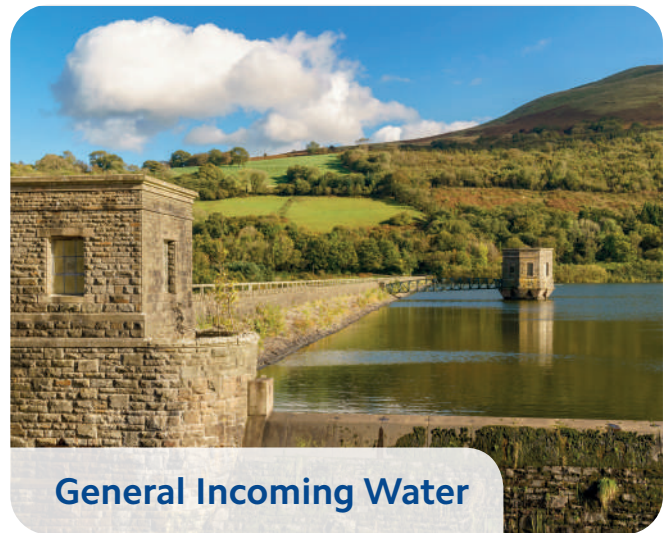
# Typical Applications

The most popular choice for general incoming water, depth cartridges provide excellent dirt-holding capacity and a greater level of filtration accuracy over alternative technologies, such as bag filters. Depth has traditionally been a simple, low cost solution for wide range particle reduction, more recently complex technologies have enabled more targeted removal within specific applications.

Although used extensively for general particulate removal, many cartridges have also been developed using modified materials and advanced techniques for improved temperature resistance, chemical compatibility, precise filtration for exact classification as well as bespoke solutions for challenging applications.



**Adhesives**



**General Incoming Water**

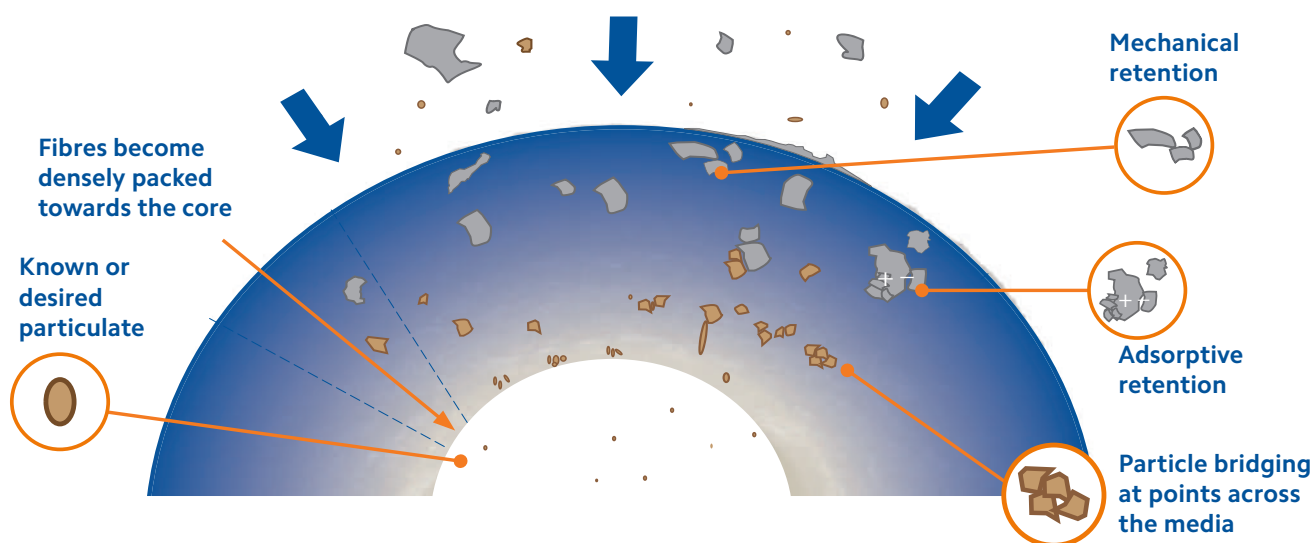


**Paints and Inks**

# What is Depth Filtration?

Successfully used in a variety of applications, depth filtration utilises a thick layer of media to effectively trap and retain various particulate. Commonly specified as the first stage of a filtration cascade, more advanced manufacturing techniques have now developed depth cartridges suited to improving downstream filtration.

## Cross-Section of a Depth Cartridge



## How do Depth Filters Work?

As liquid from the inlet is sent twisting and turning on a tortuous path through the filter cartridge, particles become caught in the densely packed fibres of a depth filter - this sieving or interception is known as mechanical retention. With the introduction of graded-depth filtration, a broad range of particulate can be captured across the entirety of the depth media.

From outside to in, the media fibres become densely packed with larger particulate captured first, allowing smaller particles to be progressively intercepted. As well as the physical interception, fibres also naturally attract particles via Van de Waals force. This adhesion process is known as adsorptive retention.

## Typical Applications

Depth filtration offers a myriad of solutions to suit many applications:

- Incoming water
- Pre-RO
- General pre-filtration
- Particulate removal
- High temperatures
- Aggressive solvents
- Food grade compatibility
- High viscosity liquids
- Adhesives
- Paints and inks

# Technology Developments

For over 50 years, string wound cartridges have been used as a basic form of filtration. Development in manufacturing processes and technologies have resulted in more advanced cartridges with improved performance characteristics and capabilities.



## Spun Bonded Fibres

**Advanced range of solutions for efficient prefiltration or particulate classification**

- The most popular option for sediment reduction
- More precise filtration over wound technology
- Particulate is retained throughout the depth of the filter media
- Increased void volume (available space for particulate to be retained) maximises dirt holding capacity
- Suitable for applications from batch process to drinking water



## Wound String Fibres

**Ideal for high temperature and chemical compatibility applications**

- Tried and tested technology
- Cost effective particulate filtration
- Multiple options of filter media and core material
- Suitable for high temperature and aggressive chemicals
- Wide micron rating options from 0.5 to 150 micron



## Specialist Materials

**Ideal for high viscosity and high temperature applications**

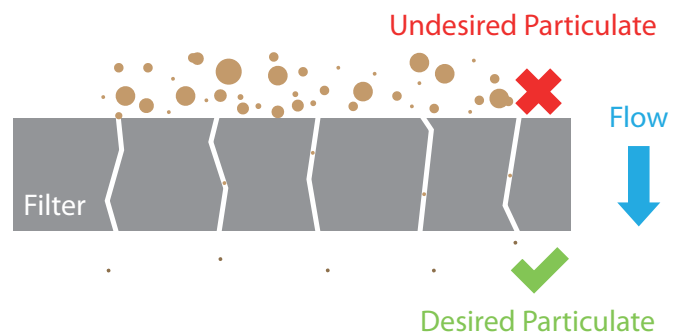
- Specially designed for more challenging applications
- Technologies applied to overcome high viscosity processes
- Products for superior performance in paint and ink applications
- Cartridges infused with antibacterial additives

# Industry Terms Explained

The filtration industry and its associated technical terms can sometimes be misleading or confusing, with different manufacturers using various testing parameters and terminology to promote certain elements of their products performance. Filerder have compiled a list of technical jargon typically used within the industry to help explain filter performance, benefits and key features.

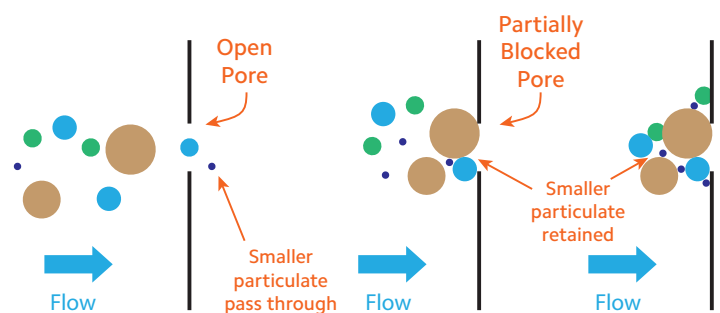
## Classification

This process, sometimes referred to as 'sharp-cut off', removes the targeted contaminants whilst retaining smaller desirable or acceptable particles such as colour, flavour and odour, which are critical to the final product.



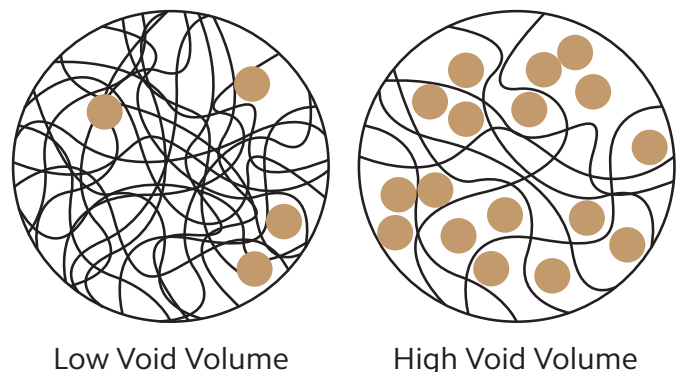
## Micron Rating Creep

As a filter cartridge is used, the pores within the filter matrix become partially or completely blocked by the retained particulate. This means that particulate smaller than the micron rating of the cartridge can sometimes be filtered from the incoming fluid. Specialised cartridges, such as the CP2, are designed with an advanced fibre matrix to reduce the effects of micron rating creep.



## Void Volume & Void Volume

Maximising the available internal space for retained particulate, whilst maintaining cartridge strength and efficiency, is the key to producing an effective filter cartridge. Modern manufacturing techniques use extremely fine fibres resulting in lightweight construction to optimise the void volume of the cartridge, increasing its dirt holding capacity and therefore effectively increasing its service life.





# Beta Ratio Explained

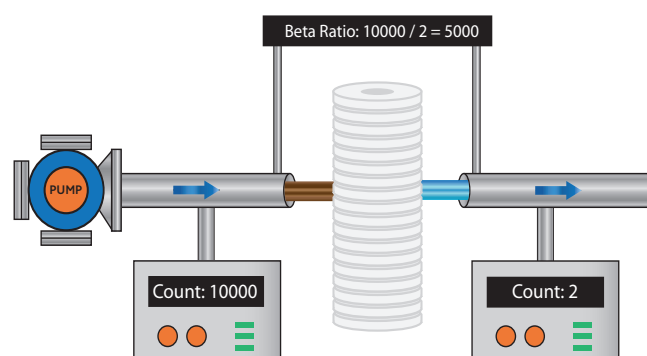
The table below shows the relationship between beta ratio and filter efficiency:

| Upstream Contaminant Concentration (mg/l) | Downstream Contaminant Concentration (mg/l) | Beta Ratio | Filter Removal Efficiency (%) |
|---|---|------------|-------------------------------|
| 10000                                     | 1000  | 10         | 90                            |
|   | 500   | 20         | 95                            |
|   | 100   | 100        | 99                            |
|   | 10  | 1000       | 99.9                          |
|   | 2   | 5000       | 99.98                         |

e.g. upstream ÷ downstream = beta ratio  
10000 ÷ 10 = 1000

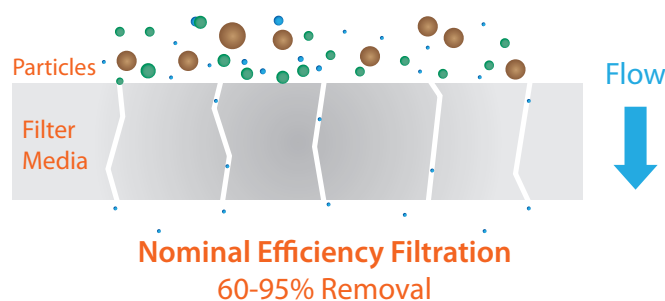
## Beta Ratio

Bringing a standardised method to determine filter efficiency, beta ratio testing, typically used for high efficiency cartridges, measures controlled contaminant such as AC fine test dust at a specific micron size both upstream and downstream of a filter element. The beta ratio is calculated by dividing the number of particulate recorded on the upstream side of the filter by the number of particulate recorded downstream. The higher the beta ratio, the more efficient the cartridge at that micron rating.



## Nominal Efficiency Rating

Nominal rating describes the ability of a filter to remove particulate at the stated micron size and above e.g. 80% at 10 micron. For improved classification and particle reduction **high efficiency** cartridges remove at least 95% of contaminate. There is no standardised method to determine the nominal rating of a filter, therefore some manufacturers will not state their products efficiency or will use larger particulate to increase the value. **To make product comparison and selection as simple as possible, Filder list the particle removal efficiency of each filter at its given micron rating.**



## Absolute Efficiency Rating

The absolute rating of a filter describes the diameter of the largest particle that would pass through the filter under laboratory conditions. In the filtration industry it is typically used to describe a filter with an efficiency of 99.9% or above at a specific micron size, e.g. 99.9% at 1 micron. Absolute rated filters are recommended for use in more critical applications and processes where known filtrate quality is essential.



# How to Select Your Depth Filter

Four simple steps are all it takes to select a depth filter.

**1**  
Technology  
Options

**4**  
End-Cap

**3**  
Length

**2**  
Micron  
& Media



**1**

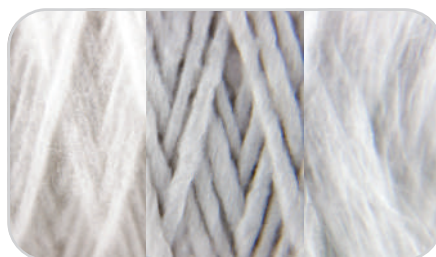
## Technology Options

Select the filtration technology suitable to your application.



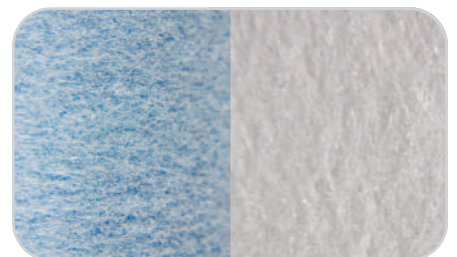
### 1. Spun Technology

Spun-bonded technologies available across varying media, grades and sizes.



### 2. Wound Technology

Tried and tested filtration, for high temperature and chemical compatibility.



### 3. Speciality Technologies

Innovative designs for effective filtration in more challenging applications.

2

## Micron & Media

Select the cartridge media based on required performance and liquid suitability.

3

## Length

Choose the cartridge length based on the required diameter and flow.

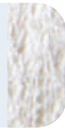
4

## End-Cap

Select end-caps where suitable. As standard, cartridges do not have end-caps.

Economic Spun Polypropylene  
**Broad application capability**

1-150 µm 65°C



4 7/8"

Up to 15 LPM

30"

Up to 45 LPM

9 7/8"

Up to 15 LPM

40"

Up to 60 LPM

20"

Up to 30 LPM

Standard Spun Polypropylene  
**WRAS approved food grade cartridge**

1-50 µm 65°C



4 7/8" \*

Up to 15 LPM

40"

Up to 60 LPM

9 7/8"

Up to 15 LPM

9 3/4" BB

Up to 15 LPM

20"

Up to 30 LPM

20" BB

Up to 30 LPM

30"

Up to 45 LPM

\* SSP Only

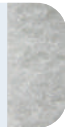
Premier Spun Polypropylene  
**WRAS approved, high dirt holding with end-cap options**

1-50 µm 71°C



Spun High Efficiency  
**High efficiency water filtration**

1-10 µm 65°C



9 7/8"

Up to 10 LPM

30"

Up to 30 LPM

20"

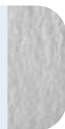
Up to 20 LPM

40"

Up to 40 LPM

Z.Plex Absolute Polypropylene  
**Absolute water filtration**

0.5-30 µm 82°C



9 7/8"

Up to 10 LPM

30"

Up to 30 LPM

20"

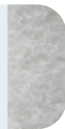
Up to 20 LPM

40"

Up to 40 LPM

Spun Nylon  
**Aggressive solvent applications**

1-20 µm 120°C



9 7/8"

Up to 15 LPM

30"

Up to 45 LPM

20"

Up to 30 LPM

40"

Up to 60 LPM

Wound Polypropylene  
**General particulate removal e.g. sand, silt and rust**

0.5-150 µm 65°C



4 7/8"

Up to 7.5 LPM

40"

Up to 60 LPM

10"

Up to 15 LPM

20"

Up to 30 LPM

10" BB

Up to 15 LPM

30"

Up to 45 LPM

20" BB

Up to 30 LPM

Wound Cotton  
**Degreasing and electroplating cleaning baths**

1-100 µm 80-120°C



Wound Glass Fibre  
**High temperature oil applications**

1-100 µm 400°C



10"

Up to 15 LPM

30"

Up to 45 LPM

20"

Up to 30 LPM

40"

Up to 60 LPM

Antimicrobial - Silver Impregnated Spun Polypropylene  
**Inhibits microorganism growth**

5 µm 65°C



9 7/8"

Up to 15 LPM

40"

Up to 60 LPM

20"

Up to 30 LPM

9 3/4" BB

Up to 15 LPM

30"

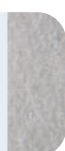
Up to 45 LPM

20" BB

Up to 30 LPM

CP2 - Bicomponent Polypropylene  
**High viscosity liquids, such as adhesives, resins, paints and inks**

1-350 µm 80°C



9 3/4"

Up to 15 LPM

29 1/4"

Up to 45 LPM

10"

Up to 15 LPM

30"

Up to 45 LPM

19 1/2"

Up to 30 LPM

39"

Up to 60 LPM

20"

Up to 30 LPM

40"

Up to 60 LPM



DOE -  
Double  
Open End



A - Open End



E - 222  
M - 224



F - 226



H - Fin



S - Closed  
End



K - Self  
Spring