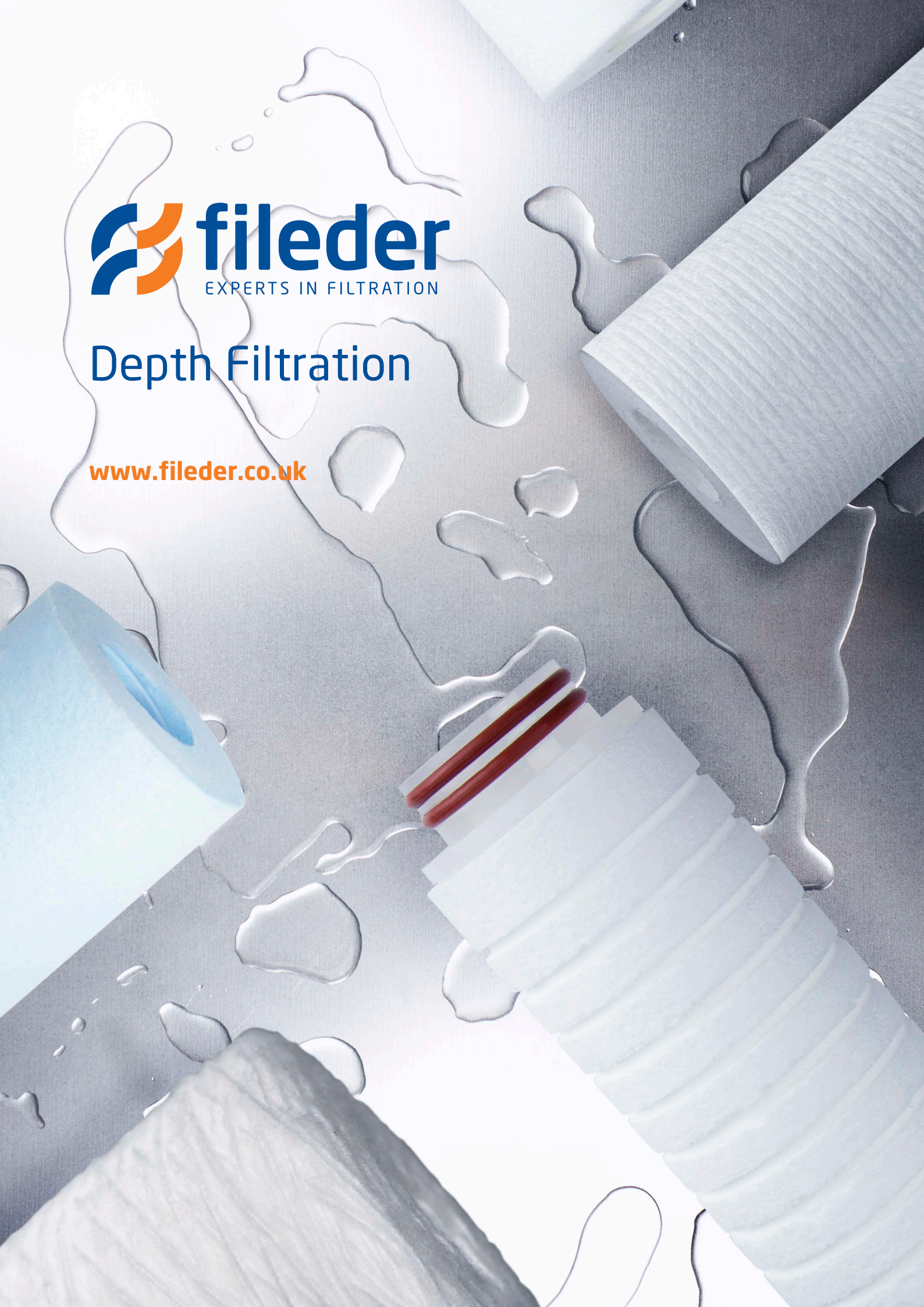




# Depth Filtration

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EXPERTS IN FILTRATION

## Depth Filtration

Effective at removing a broad range of particulate, depth cartridges are typically used to provide economic, consistent and efficient batch, pre and final filtration.





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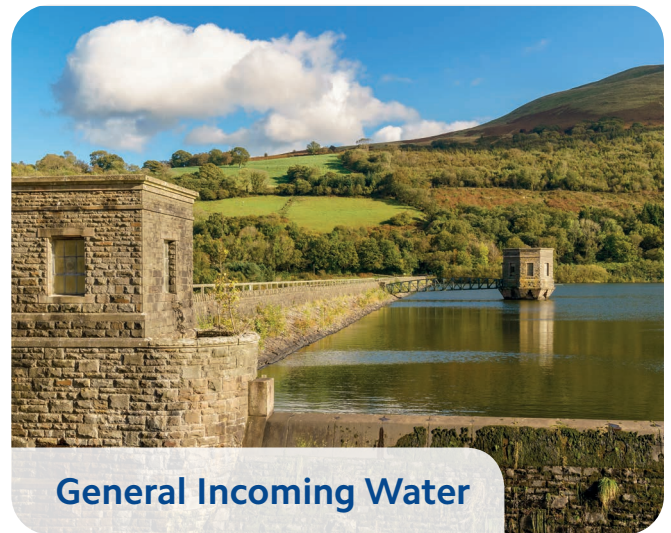
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# Typical Applications

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.

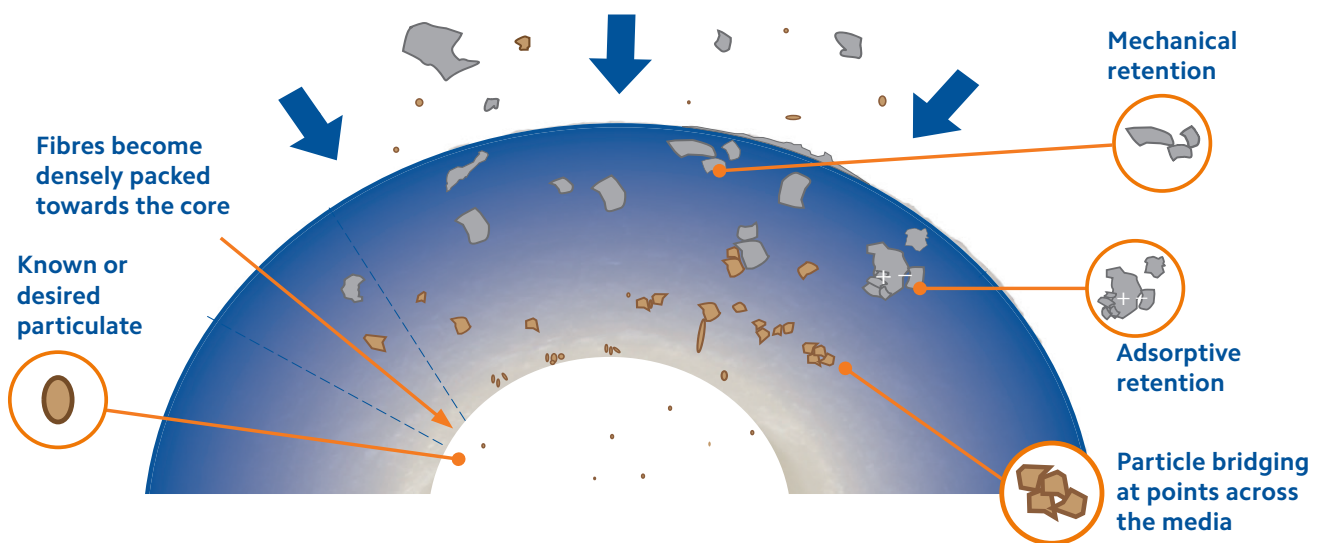
Although used extensively for general particulate removal, many cartridges have also been developed using modified materials and advanced techniques for improved temperature resistance, chemical compatibility, precise filtration for exact classification as well as bespoke solutions for challenging applications.



# 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.



**1 Million+**  
**Supply Capabilities**

Each year Filerder supplies the equivalent of more than 1 million 10" depth cartridges



## 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



## TruDepth Economic Spun Polypropylene

### 1-150 micron

The lowest cost spun-bonded cartridge in the SPECTRUM range, the TruDepth Economic cartridge is ideally suited for batch processes where repeated change-out is required. With a graded density

construction, this entry level cartridge is excellent at preventing premature blinding of other filtration systems further downstream.



## Key Features

- Graded density construction for broad range of particle size removal
- Lowest price option without compromising on quality
- Thermally bonded matrix ensures a strong structural integrity preventing fibre migration

## Typical Applications

- General incoming water filtration
- Nozzle and pump protection
- Entry level batch process filtration

## Specification

Efficiency  
70%

Max. Operating Temperature  
65°C

Max. Operating Pressure Differential  
2 bar at 21°C

## Materials of Construction

Filter Media  
Polypropylene

## Compliance

FDA Compliant Material  
Regulation (EC) 1935/2004  
Regulation (EU) No10/2011

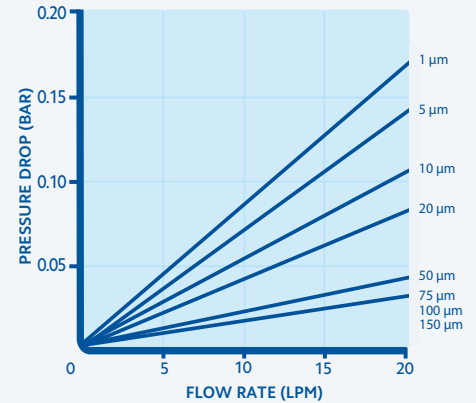
## Configurations

Micron (µm)

1 5 10 20 50 75 100 150

Length (")

4% 9% 20 30 40



Water at 20°C. 9% cartridge.

## Dimensions & Packaging



Length (")	Dimensions (mm)		
	A	B	C
4%	28	124	63
9%	28	250	63
20	28	508	63
30	28	762	63
40	28	1016	63

Packaging	
Box Qty	Box Weight (kg)
48	4
24	4
24	8
15	8
15	10

## Part Number

Code	Micron	Length
ESP	1, 5, 10, 20, 50, 75, 100, 150	4%, 9%, 20, 30, 40

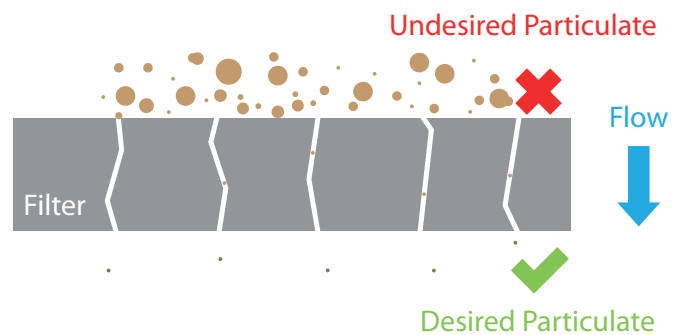
e.g. ESP-1-97/8

# 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.

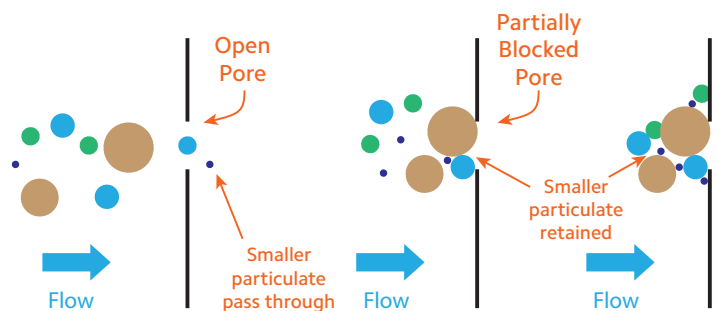
## Classification

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.



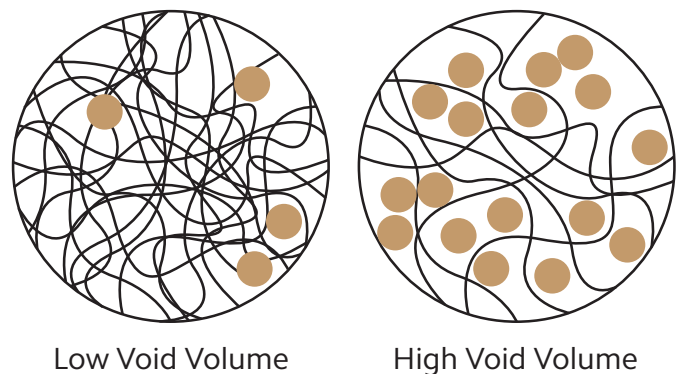
## Micron Rating Creep

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

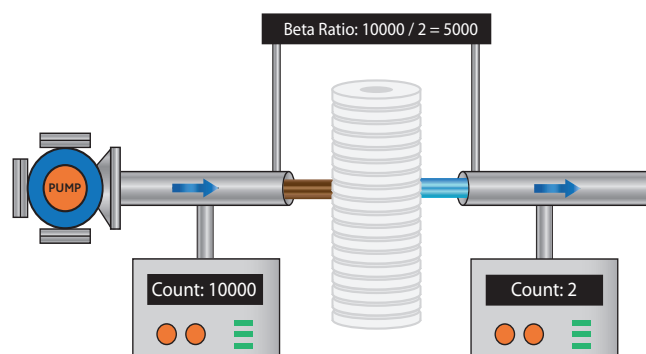
The table below shows the relationship between beta ratio and filter efficiency:

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  
 $10000 \div 10 = 1000$

## 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, Filerder list the particle removal efficiency of each filter at its given micron rating.**

















## Absolute Efficiency Rating

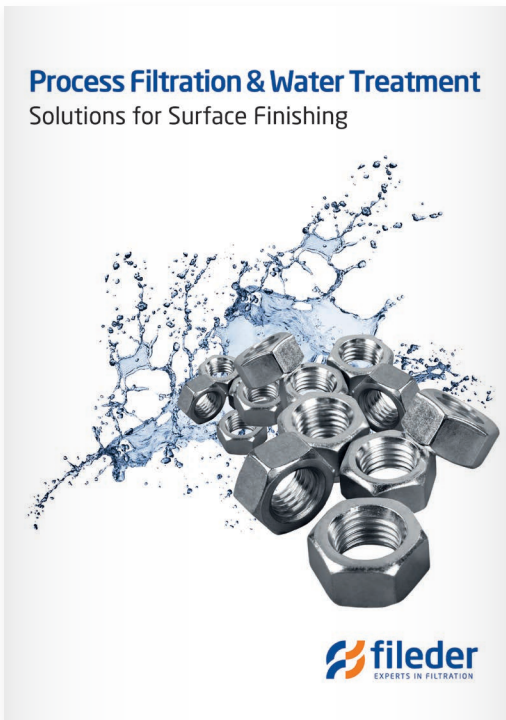
The absolute rating of a filter describes the diameter of the largest particle that would pass through the filter under laboratory conditions. In the filtration industry it is typically used to describe a filter with an efficiency of 99.9% or above at a specific micron size, e.g. 99.9% at 1 micron. Absolute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

Product Brochures



	Pleated Filtration
	Depth Filtration
	Stainless Steel Cartridges
	High Flow Filtration
	Water Treatment - Carbon & Media Cartridges
	Filter Housings
	Bag Filtration
	Pure Water Membranes
	Pressure Vessels & Media
	Water Softening & Conditioning
	UV Systems
	Food Service
	Filtration & Water Treatment Rental
	Installation & Servicing

Application Brochures



	Solutions for Surface Finishing
	Solutions for Hospitals
	Solutions for Beverage Production
	Solutions for the Coatings Industry
	Solutions for Bacteria and Parasites
	Solutions for Cosmetics and Toiletries
	Filtration for Municipal Water with DWI
	Solutions for Cryptosporidium Protection
	Solutions for Chemical Production

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