WATER ABSORBING ST FILTER

Smart Filtration Solutions Ultra High Efficiency Filters are designed with Donaldson's proprietary synthetic media to remove 99.98% of abrasive particulates in a single pass. All our filters are equipped with Viton® seals to have optimum compatibility with various fuels & oils.
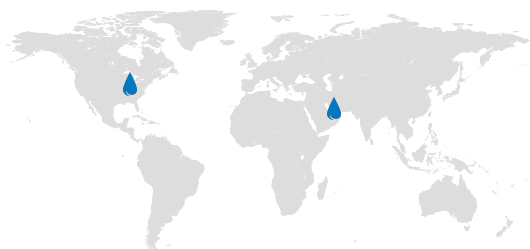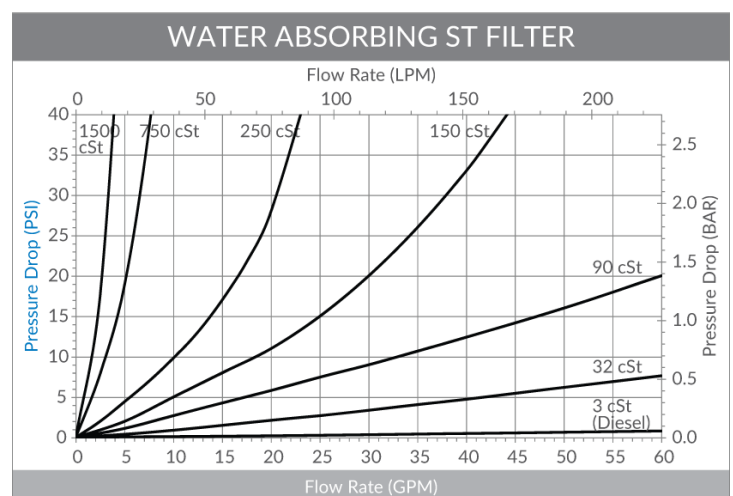
Water Absorbing ST Filter

Contains Expanding Media For Water Detection

Max Working Pressure:	350PSI / 24.1bar (per NFPA/t3.10.17)
Rated Static Burst:	800PSI / 55.2bar (per NFPA/t3.10.17)
Max Flow Range:	65 gpm / 246 lpm
Operating Temperature:	40°F to 190°F / -40°C to 88°C
Outer Diameter:	4.60 Inches (117 MM)
Length:	14.24 Inches (362 MM)
Manufacturer:	Donaldson Company, Inc.
Country of Origin:	USA
Gross Weight in Kilograms:	2.06

ISO=International Standards Organisation

NFPA = National Fluid Power Association

WATER ABSORBING ST FILTER

Understanding Liquid Filter Efficiency

This information is provided as an aid to understanding filter efficiency terminology based on current ISO, ANSI and NFPA test standards.
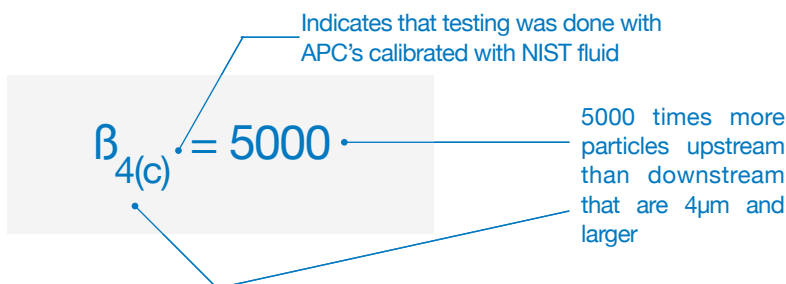
What Is a Beta Ratio?

Beta ratio (symbolized by ß) is a formula used to calculate the filtration efficiency of a particular fluid filter using base data obtained from multi-pass testing.

In a multi-pass test, fluid is continuously injected with a uniform amount of contaminant (i.e., ISO medium test dust) then pumped through the filter unit being tested. Filter efficiency is determined by monitoring fluid contamination levels upstream and downstream of the test filter at specific times. An automatic particle counter is used to determine the contamination level. Through this process an upstream to downstream particle count ratio is developed, known as the beta ratio.

The formula used to calculate the beta ratio is:

$$\text{Beta ratio}_{(x)} = \frac{\text{particle count in upstream fluid}}{\text{particle count in downstream fluid}}$$

where$_{(x)}$ is a given particle size

Indicates that testing was done with APC's calibrated with NIST fluid

$$\beta_{4(c)} = 5000$$

5000 times more particles upstream than downstream that are 4μm and larger

What is Efficiency?

The beta ratio is commonly used to calculate the filtration efficiency of a filter and can be converted into a percentage of efficiency at a given particle size.

The formula used to calculate efficiency is:

$$\text{Efficiency}_{(x)} = \frac{\beta - 1}{\beta}$$

where$_{(x)}$ is a given particle size

$$\beta_{4(c)} = 5000 \text{ is same as } 99.98\% @ 4\mu m$$

ß5000 is 99.98% for particles 4μm and greater

How Big is a Micron?

Compare a micron size to these familiar particles.

Grain of table salt	100μm
Human hair	80μm
Lower limit of visibility	40μm
White blood cell	25μm
Talcum powder	10μm
Red blood cell	8μm
Bacteria	2μm
Silt	<5μm

Beta Ratio (at given particle size)	Efficiency (at the same particle size)
1.01	1.00%
1.1	9.10%
1.5	33.30%
2 (Nominal)	50.00%
5	80.00%
10	90.00%
20	95.00%
75 (Absolute)	98.70%
100	99.00%
200	99.50%
1000	99.90%
2000	99.95%
5000	99.98%

- Without Beta Ratio / Efficiency information, Micron rating alone is meaningless.

- Focus must be on Beta Ratio, rather than just Efficiency %, as we can see above, 98.70% & 99.98% might not sound too big of a difference but in Filtration World, that's a huge difference.