

WHAT IS TETRATEX®?

Tetratex filter media can enhance the performance of your fabric filter by utilizing surface filtration technology as opposed to traditional depth filtration methods. Tetratex is a proprietary expanded microporous PTFE (Polytetrafluoroethylene) membrane, manufactured solely by Donaldson Membranes. It is laminated to a variety of base substrates to provide a complete range of media including woven and felted textile media for conversion into all types of filter bag as well as pleatable media for cartridges style elements.

DEPTH VS SURFACE

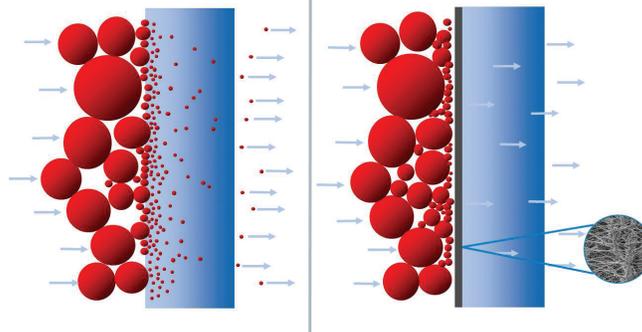
For collection to be effected, any individual particle in the gas stream must be slowed, intercepted and collected on or within the filter media.

In the case of conventional filter fabrics, the interstices between the fibers within the structure of the media are often considerably larger than the particles to be collected. The dust particles penetrate the surface of the media to 'close off' the open pores, forming a filter cake on the surface of the media. This is termed '*depth filtration*'. Without a filter cake on their surface, conventional filter media are rarely able to collect fine particulate efficiently; media blinding and atmospheric emissions occur over time as individual dust particles penetrate into and beyond the filter media.

Tetratex filter media utilizes true '*surface filtration*' technology. A microporous ePTFE membrane, it is laminated to the surface of a supporting substrate and it is this membrane which acts as the filter media. The construction of the membrane, with millions of pores per square inch, is such that sub-micron particles are captured on its surface. The backing substrate is merely a support and plays no part in the filtration process. All particulate is collected on the surface of the membrane. No reliance on a filter cake. No penetration of dust into or beyond the media.

Depth Filtration

Particles penetrate the structure of the media and form a filter cake on the surface



Surface Filtration

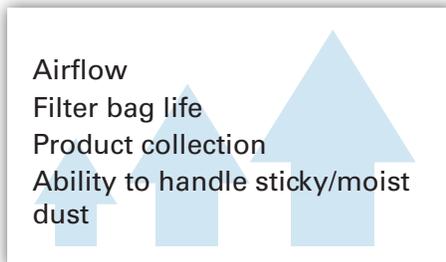
Particles are collected on the surface of the membrane



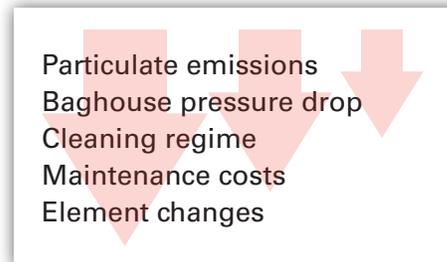
BENEFITS OF TETRATEX

Tetratex ePTFE membrane filter media can bring about a wide range of benefits for your fabric filter baghouse; the unique structure of the membrane prevents the penetration of fine dusts into the supporting substrate and facilitates excellent cleanability due to its non-stick characteristics.

INCREASE



DECREASE



POTENTIAL OPERATIONAL SAVINGS - PRODUCTION

By employing Tetratex ePTFE membrane filter media, increased system airflow can be achieved through reduced filter pressure drop (see above DP comparison). This can bring about significant production benefits.

The following example considers a cement finish mill process utilizing an estimated 10% increase in airflow. Where other system parameters are acceptable, the use of Tetratex media could significantly reduce the cost/ton of product and increase mill capacity.

	Conventional Filter Media - Power Consumption	Tetratex® - Power Saving
Production:	24/7 x 8000 hours	24/7 x 8000 hours
Drive:	2.4MW	2.4MW
Air Volume:	80,000 acfm	88,000 acfm
Dust Loading:	0.047 lbs/ft ³	0.047 lbs/ft ³
Current Media:	Conventional Felt	Tetratex Felt
Filter DP:	7.9 Inches H₂O	5.9 Inches H₂O
Result:	Above equates to 30.73 Kw Hr/Ton of Cement @ \$0.13/Kw Hr = \$2.78/Ton of Cement producing 898,953 Tons/year	Above equates to 27.94 Kw Hr/Ton of Cement @ \$0.13/Kw Hr = \$2.52/Ton of Cement producing 988,849 Tons/year

POTENTIAL OPERATIONAL SAVINGS - COMPRESSED AIR

It is often possible to reduce filter bag cleaning regimes by the use of Tetratex ePTFE membrane filter media with a reduction in pulse pressure being one option. The cost to generate 1ft³ of air at a reduced 58 lb/in² pressure with Tetratex bags compared to 87 lb/in² with conventional media is considered in the following example for a filter consuming 3,600 ft³/hr of compressed air over an operating period of 8,000 hours at a power cost of \$0.13/KwHr.

Assumes a reduction in compressed air pressure from 87 psi to 58 psi		
EXAMPLE	Total Compressed Air Usage (CFM)	60
	Total Hours	8000
	Cost of Power (\$/Kw Hr)	0.13
	Expected Power Saving (€)	\$3,181/year

Estimated requirement for effective cleaning: 0.118 ft³ of compressed air for every yd² of cloth.

POTENTIAL OPERATIONAL SAVINGS - FAN POWER

In cases where end-users are seeking to reduce their energy consumption, Tetratex ePTFE membrane filter media is a proven technology. By considering standard fan laws governing air movement systems (eg. backward inclined fansets), we can calculate the potential cash savings by operating a typical system at a reduced filter pressure drop.

$$Q = (V \times \Delta P) / \text{Eff.}$$

By maintaining required airflow at a reduced filter DP at a lower fan speed, energy absorbed by the fan is reduced and significant savings in power consumption can be achieved. The following example is based on a system with an estimated 1.0 Inches WG reduction in filter pressure drop using Tetratex, a total flow of 100,000 acfm running for 8000 hours per year with a power cost of \$0.13/KwHr.

EXAMPLE

Where:

Q = Absorbed power of fan (Watts)

V = Total gas flow (acfm)

ΔP = Total system resistance (Inches H₂O)

Eff. = Efficiency of fan % - for a backward-inclined fan, this is typically around 70%

Volume (ACFM)	100,000
Hours	8,000
Cost of Power (\$/Kw Hr)	0.13
DP Reduction (Inches H ₂ O)	25
Fan Power Saving	\$17,457

Note: In most cases, the fan speed will need to be adjusted down to facilitate such savings. This can be achieved through vee-belt adjustments or via a frequency inverter drive.

TETRATEX IN ACTION

TETRATEX® INCREASES PRODUCTIVITY BY 300 TPD

Improvements after the installation of the Tetratex Acid Resistant Woven Fiberglass fabric filter bags to the kiln were significant;

Results after 4 weeks

- Flow rate increased by 25%
- Particulate emission were kept below .01 g/SDF³
- Air to cloth ratio increased by 69%
- Productivity increased by 300 TPD
- Bag life increased 5x



TETRATEX IMPROVES AIRFLOW RATE TO 105,650 CFM

The employment of Donaldson Membranes' Tetratex Polyester has substantially increased the airflow handling capability of the baghouse serving a difficult cement finish mill;

Results after 4 weeks

- Flow rate increased to 179,500m³/h
- Differential pressure decreased by 34%
- Cleaning pressure reduced to 70 psi resulting in lower energy consumption and fewer cleaning cycles
- The plant manager was impressed with the results

IN PARTNERSHIP

Donaldson Membranes is a leading worldwide manufacturer of expanded microporous PTFE membranes. A technology-driven company committed to satisfying customer needs through innovative research and development, with production and sales offices located throughout America, Europe, and Asia.

Donaldson places great emphasis on high quality manufacturing and customer service and has been certified to ISO 9001 and environmental ISO 14001, testaments to our high standards.

We offer a thorough and educated evaluation of your system process to determine the most suitable filter media solution. We work closely with our partners to provide comprehensive technical expertise. Our experience in innovative design, manufacturing, filtration knowledge and technical support will help you and your organization to succeed.



We believe in partnering with our customers to provide filtration solutions that offer added value. Our global presence with worldwide sales and manufacturing locations allows Donaldson to reach the international market place with both application support and supply chain.

Meet our customers' requirements on time, everytime-through innovation and continous improvement.

The examples cited are indicative of expected results in field applications. Please contact us if you would like advice on maximizing filter efficiencies. We offer a range of support services including troubleshooting and filter media analysis.



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