Donaldson
FILTRATION SOLUTIONS

FILTRATION SOLUTIONS FOR INDUSTRIAL PROCESSES

Tetratex® ePTFE Membrane Filter Media can help:

- Optimize filter performance
- Increase bag life and production rates
- Reduce downtime

Tetratex®

ABOUT DONALDSON MEMBRANES

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

Donaldson places great emphasis on high quality manufacturing and customer service and has been accredited ISO9001 and environmental certificate ISO14001, testaments to our high standards.

WHAT IS TETRATEX®?

Fabric filters are an intrinsic part of many industrial processes. Whether a filter collecting the actual product being manufactured or a pure environmental emission control measure, there is a clear need to maximise performance to ensure collection rates are high, particulate emissions are low and gas flows are maintained at optimum levels for the process concerned.

The Challenges

Each and every application is different and carries with it a specific set of challenges. A host of factors can influence the performance of any given fabric filter, but the selection of an appropriate filter media is critical.

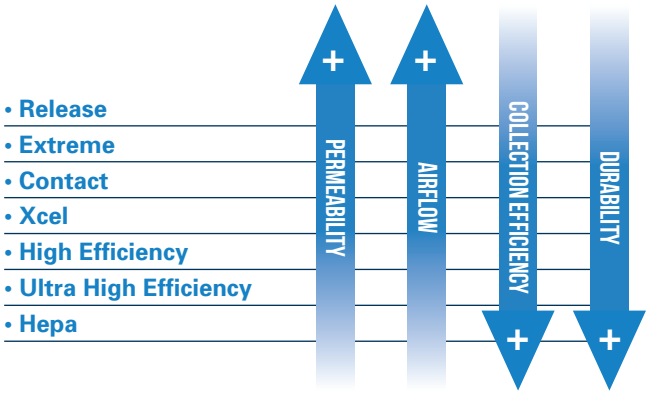
Optimizing Performance

Tetratex® filter media can enhance the performance of your fabric filter by utilising 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.

Since Tetratex filter media first entered the market over thirty years ago, it has been successfully employed in a vast array of dry filtration applications providing high-level performance and exceptional customer satisfaction.

TETRATEX CAN DELIVER OPERATIONAL SAVINGS

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



TETRATEX: THE SOLUTION TO YOUR PRODUCTION CHALLENGES

Tetratex®

Reduced Energy Consumption

1 Significant savings in power consumption can be achieved by maintaining required airflow at a reduced filter DP. Surface filtration principles inhibit particle migration resulting in increased cleaning efficiency.

Reduced Emissions

2 Near-zero emissions can be achieved due to the microporous structure of the membrane. Particulate is collected on the surface, reducing environmental emissions within regulatory limits.

Production Savings

3 Increased system airflow can be achieved through reduced filter pressure drop, significantly reducing the cost per ton of product.

Reduced Downtime

4 Excellent cake release capability and low cake formation allows for reduced cleaning and less mechanical stresses. This helps to prolong bag life and reduce bag changes.

REDUCING PRESSURE DROP - INCREASING AIRFLOW - REDUCING EMISSIONS

Pressure Drop

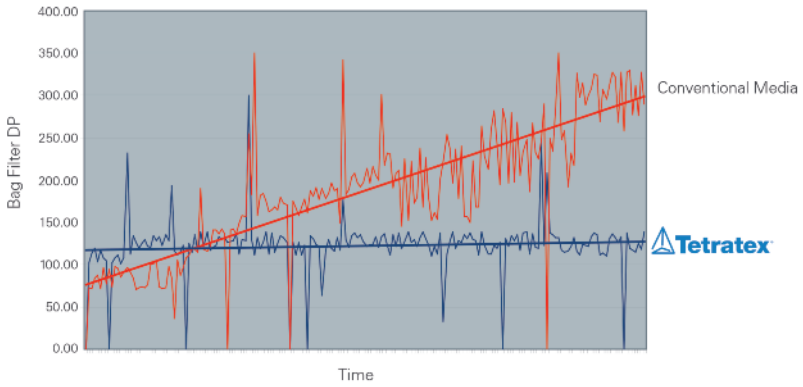
All too often, baghouse pressure drop is the primary cause of frustration for operators seeking to improve extraction or airflow through their filtration system. Whether to increase throughput and increase production rates or to improve extraction from a dust source, baghouse pressure drop will ultimately dictate matters.

Achieving Balance

Ordinarily, increasing airflow results in a similar increase in filter differential pressure (DP), with conventional filter media being unable to clean effectively at the higher resultant filter velocity (air-to-cloth ratio). Additionally, the higher DP only serves to exacerbate the problem with fine dust particles being drawn deeper into the structure of the media, restricting permeability and reducing element life expectancy.

Surface Filtration Principles Help Maintain Constant DP

Tetratex filter media operates by utilising surface filtration principles. The membrane on the filtering surface of the media prevents penetration of fine particles into the substrate. When cleaned, there is a near total removal of dust from its surface. It is this twin-action characteristic that enables Tetratex to increase airflow without compromising baghouse DP. The permeability of Tetratex media is maintained at all times and so DP is not only lower, but is kept constant throughout the life of the filter elements.



The above chart details indicative results of comparative bag filter pressure drop of Tetratex vs conventional media in a Cement Finish Mill.

REDUCING PRESSURE DROP - INCREASING AIRFLOW - REDUCING EMISSIONS

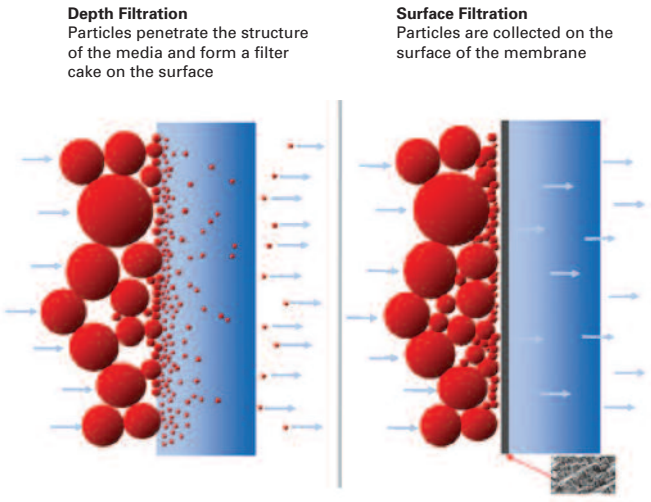
Tetratex ePTFE membrane filter media can bring about a wide range of benefits for your fabric filter baghouse, the unique structure of our membrane prevents the penetration of fine dusts into the supporting substrate and facilitates excellent cleanability due to their non-stick characteristics.

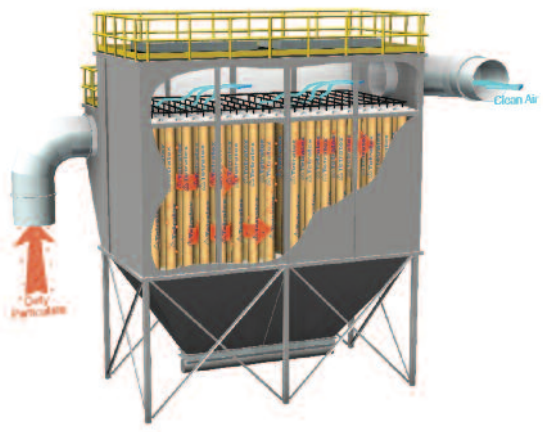
Whilst inhibiting penetration of fine dust particles into the structure of the media assists airflow, it also allows exceptionally low particulate emission levels to be achieved. Where appropriate membrane selection, application understanding and element manufacturing expertise are brought together, near-zero emission levels are commonplace. Not only does this reduce operators' impact on their environs, but also increases product collection; why send your product out to atmosphere?!

Selecting the Correct Filter Media Solution

It should be noted that no two baghouses are ever alike. The demands placed on filter mediainstalled are constantly changing. The selection of an appropriate substrate to handle the gas conditions being experienced is vitally important as is the selection of the appropriate membrane. Donaldson manufacture a number of differing ePTFE membranes, each providing its own unique filtration characteristics.

Donaldson can advise on the membrane requirements for any given set of process parameters to ensure optimum performance.





Chemicals

Increasing collection efficiencies, reducing energy consumption and environmental emissions are three of the greatest challenges facing the chemical industry today. Donaldson Membranes can help overcome these challenges by providing Tetratex® ePTFE membrane filter media at a low-cost to meet the increasingly demanding nature of the Chemicals process dedusting applications.

Tetratex delivers...

- Improved particulate collection efficiencies
- Reduced energy consumption & emissions
- Increased productivity
- Increased filter element life

Process: Chromium Oxide Plant
Media: Tetratex Ultra High Efficiency Woven Fibre Glass

BEFORE:	AFTER:
Flow rate: 145,500 Am^3/h	Flow rate increased by 19%
Differential pressure: 180mmWG	Differential pressure reduced by 28%
Cleaning pressure 6.5 bar	Cleaning pressure reduced by 40%

Process: Calcium Flouride (CaF_2)
Media: Tetratex Xcel

BEFORE:	AFTER:
Particulate emissions: 200mg/Nm^3	Particulate emissions decreased by 90%
Differential pressure: 150mmWG	Differential pressure reduced by 20%
Media life: <3 months	Media life increased by 400%

• Calcining • Milling • Kilns • Dryers • Micronising • Classifying • Venting •

Power Generation

The burning of both traditional and alternative fuels to generate heat and power is a growing industry, but one which must comply with stringent process control and environmental legislation. Tetratex ePTFE membrane filter media can provide significant benefits for boiler process.

Tetratex delivers...

- Exceptionally low particulate emissions
- Stable gas flow through the system
- Greater ability to recover from process upsets

Process: Coal Fired Boiler
Media: Tetratex Xcel

BEFORE:	AFTER:
Particulate emissions: >50mg/Nm^3	Particulate emissions reduced to: <5mg/Nm^3
Differential pressure: 250mmWG	Differential pressure reduced by 30%
Media life: 12 months	Media life increased by 300%

Process: Biomass Incinerator
Media: Tetratex Ultra High Efficiency Woven Fibre Glass

BEFORE:	AFTER:
Particulate emissions: >20mg/Nm^3	Particulate emissions reduced to: <5mg/Nm^3
Plant efficiency: <14MW/h	Output increased by 20-30%
Expected filter media life: >6 years	

• Coal • Biomass • Municipal • Paper • Sludge • Flue Gas Cleaning •

Metals

Whether it be primary manufacture or secondary recycling, the production and processing of metals, brings with it a wide variety of filtration challenges. Hot gases, fine dust and aggressive process conditions are all problems that can be solved by employing Tetratex ePTFE membrane filter media. Industry leaders are benefiting from the use of Tetratex in their baghouses.

Tetratex delivers...

- Optimisation of extraction
- Increased filter element life
- Increased production rates
- Reduced emissions

Process: Electric Arc Furnace
Media: Tetratex Ultra High Efficiency Polyester Felt

BEFORE:	AFTER:
Particulate emissions: >60mg/Nm³	Particulate emissions reduced to: <10mg/Nm³
Differential pressure: 200mmWG	Differential pressure decreased by 32.5%
Summary: Lifetime of media was increased by 400%	

Process: Steel - Shot Blasting
Media: Tetratex High Efficiency Polyester Antistatic Pleatable Media

BEFORE:	AFTER:
Differential pressure: 220mmWG	Differential pressure decreased by 10%
Media life: 1-2 months	Media life increased by 150%
Summary: A competitors product was only lasting 1-2 months, resulting in frequent unexpected stoppages to production, high pressure drop, frequent replacement and an increase in operational cost.	

• Aluminium • Copper • Ferro Alloys • Lead • Nickel • Steel • Smelting • Grinding • Furnace Extraction •

Minerals

The minerals industry has taken big steps in recent years to enhance process optimization and minimize the impact of their operations on the environment. Many operators now utilize advanced baghouse technology to dedust their kilns. Tetratex ePTFE membrane filter media is the media of choice for many operators providing high-level filtration performance over an extended media life.

Tetratex delivers...

- Improved airflow & throughput
- Increased production rates
- Optimisation of mill efficiencies
- Elimination of production bottlenecks
- Increased factory output

Process: Cement Finish Mill
Media: Tetratex Release Polyester Felt

BEFORE:	AFTER:
The flow rate 176,500 m³/h	Increased the flow rate to179,500 m³/h
Differential pressure 197mmWG	Differential pressure reduced by 33%
Cleaning pressure 6 bar	Cleaning pressure reduced by 20%
Summary: The plant manager was delighted with the improved performance levels of the mill and associated filter.	

Process: Cement Kiln
Media: Tetratex Ultra High Efficiency Woven Fibre Glass

BEFORE:	AFTER:
Particulate emissions: >30mg/Nm³	Particulate emissions: <30mg/Nm³
Differential pressure 160mmWG	Differential pressure reduced to <110mmWG
Summary: The installation of Tetratex ePTFE membrane filter media helped the plant to overcome the issues of high emissions and high pressure drop.	

• Raw Mills • Kilns • Coal Prep Plants • Alkali Bypass • Clinker Cooler • Finish Mills • Venting/Conveying •

Food

In food processing hygiene, quality and consumer protection are critically important. Tetratex Contact® ePTFE membrane filter media provides complete confidence.

Tetratex Contact® ePTFE membrane filter media meets certain food contact requirements in the US and EU for food contact filtration applications within food processing plants.

Fabric filters are an intrinsic part of the food manufacturing process. Whether a filter collecting the actual product being manufactured or a pure environmental emission control measure, there is a clear legislative requirement to have compliant food contact filter media. Tetratex Contact meets the laboratory tests in accordance to regulation 10/2011.

Benefits of Using Tetratex Contact

- Certified for repeat food contact use, Tetratex Contact provides complete confidence by ensuring significantly lower migration values than the threshold limit value (in accordance to standard EN1186, conducted by the Fraunhofer-Institut).
- Can be supplied with a declaration of compliance according to EU regulation 10/2011 concerning the use of plastics within critical manufacturing processes, and on request in accordance to FDA CFR 21 § 177

• Conveying • Milling • Grinding • Drying • Mixing • Venting • Blending • Extruding •

Pharmaceuticals

Fabric filters play an important part in pharmaceuticals processing, with the cost of critical ingredients rising, product reclaim and efficient filter performance are key to ensure operational costs are kept to a minimum.

Whether the filter is collecting valuable products or an emission control measure, it is critical the filter performs at optimum level.

Benefits of Tetratex ePTFE Membrane

1. Reduced Energy Consumption - maintains airflow at a reduced filter differential pressure (DP) therefore energy absorbed by the fan is reduced.
2. Production Savings - increased system airflow can be achieved through reduced filter pressure drop, significantly reducing the cost per tonne of product.
3. Reduced Downtime - Tetratex requires less frequent cleaning providing longer bag life and fewer bag changes.

• Granulating • Blending • Drying • Compressing • Screening • Coating • Pelletizing • Packaging •

IN PARTNERSHIP - APPLICATION SUPPORT

Donaldson Membranes is committed to working closely with partners to provide comprehensive technical and sales support.

Quality Solutions

Our experience in innovative design, manufacturing, filtration knowledge and technical support will help you and your organisation to succeed.

Expertise & Experience

Having an enviable resource of more than thirty years of dry filtration experience, Donaldson Membranes is able to provide a thorough and educated evaluation of your system process to best determine the most suitable Tetratex filter media solution.

Working with You to Meet Your Production Needs

The Donaldson Membranes technical team can provide assistance with manufacturing requirements, installation support, commissioning, recommended routine maintenance advice and troubleshooting, providing you with everything you require to ensure full satisfaction and a successful filtration solution.

Staying Involved

In order to ensure your application continues to run at optimum levels, regular routine condition testing of filter media is recommended. The laboratory facility of Donaldson Membranes is able to provide detailed analytical feedback, providing a full breakdown of the testing carried out (typically retained permeability, residual tensile strength and supporting microscopic photography). If carried out on a regular basis, this information can be catalogued, trended and used to highlight potential process issues which may adversely affect media performance ahead of filter problems being experienced and/or to provide an invaluable indication of expected filter element life.

Donaldson Membranes can also provide SEM (Scanning Electron Microscope) and particle size analysis capability where more detailed examination is required.

Donaldson Membranes is committed to ensuring excellent service and life-long product performance.

Tetratex®

TETRATEX® - A COMPREHENSIVE PRODUCT PORTFOLIO

Fibre Type	Tetratex® Release	Tetratex® Xcel	Tetratex® EXTREME	Tetratex® High Efficiency	Tetratex® Ultra High Efficiency	Tetratex Contact®	Tetratex® HEPA
Needlefelt							
Acrylic	5130		8235	8008			
Acrylic Antistatic			8245				
Aramid		6247	8247	8047			
Aramid Antistatic			8249				
Aramid Acid Resist		6246					
Polyester	5102	6214	8214	8005			
Polyester Antistatic	5103 5105	6273 8040	8240 8273	8024 8045			
Polyimide			8232				
Polypropylene		8041	8224				
Polypropylene Antistatic			8241				
PPS		6262	8262				
PPS Antistatic		8043	8243				
PTFE Felt				7018			
PTFE Antistatic				7025			
Food Grade							
Polyester				FG8304		FG8301 FG8303	
Polyester Antistatic						FG8305 FG8307	
Polypropylene						FG8309	
PPS						FG8318	
PTFE Felt						FG8311	
Woven PTFE				FG8315			
Pleatable							
Polyester		6280 9029	9032 9030 9031 9047	6277 9028			6287
Polyester Antistatic		9012	9040	9041			6285
Polypropylene			9034				
PPS			9035				
Woven							
Woven Glass				6254 2030	6255 1550 6255 1650 6255 1830		
Woven Glass Acid Resist				7002	7005		
Woven Polyester				6288 7009			
Woven Polyester Antistatic				7010			
Woven PTFE				7007			

*Product matrix correct as of November 2017; this chart is subject to change at any time without prior notice.

Please note: Tetratex Release, Tetratex EXTREME, Tetratex Xcel, Tetratex High Efficiency, Tetratex Ultra High Efficiency and Tetratex HEPA are not certified for Food and Pharmaceutical applications. The Tetratex Contact® range is both EU and FDA certified for Food and Pharmaceutical applications.

Donaldson

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