

We take the dust out of industry®

midwesco
Filter Resources, Inc.



TDC Filter
a midwesco® company

Efficient Filtration Solutions & Services for Baghouses and Dust Collectors



SOLUTIONS FOR ALL INDUSTRIES



We take the dust out of industry®

Specializing in Baghouse Filtration



45 YEARS OF EXPERIENCE

Midwesco Filter Resources, Inc. and TDC Filter are part of the MFRI Group. We manufacture filter bags, cages, pleated bags and cartridges for new equipment installations and replacements - supplying a wide range of industries and all types of baghouse designs.

Each one of our filters is manufactured in the US and in Europe using only documented and certified materials and manufacturing methods.

Based on our wide range of high quality products and 45 years of filtration expertise, we have the expertise to find solutions to your most difficult challenges. Our experienced sales team will visit your facility, understand your needs and develop a customized solution to meet those needs.

In addition, we offer a wide range of value added services including turnkey installation and inspection services, emission monitoring equipment, Total Cost of Ownership Savings reports, filter service life testing and more.

WE SPECIALIZE IN FILTRATION SOLUTIONS FOR



ASPHALT



METALS



SAND BLASTING



CEMENT



POWER



PAPER, PULP, WOODWORKING



CHEMICALS



POWDER COATING



OEM



FOOD & BEVERAGE

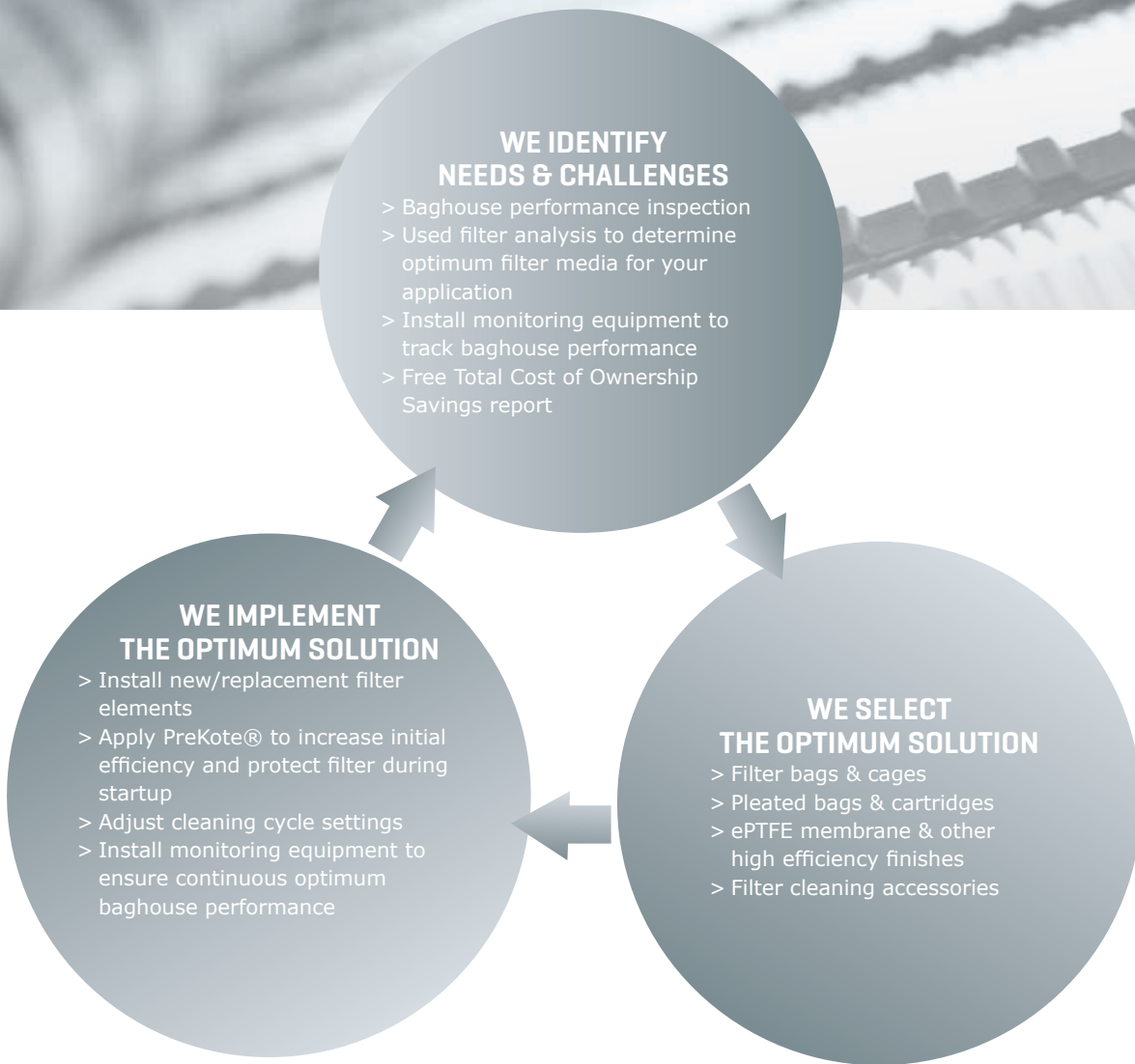


ROCK PRODUCTS



MISC. MANUFACTURING

Efficient Filtration Solutions & Services for Baghouses and Dust Collectors



Content

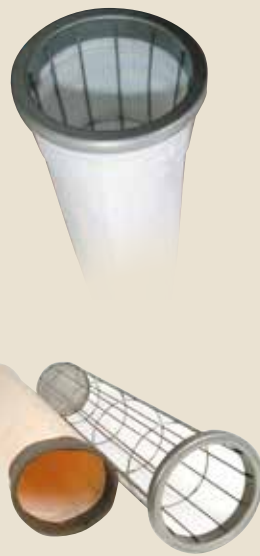
| | |
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| FILTER BAGS | PAGE 04 |
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We take the dust out of industry®

Wide Range of High Quality Filter Bags & Cages

- Manufactured by skilled workers in company-owned plants in the U.S.

Pulse Jet Bags & Filter Support Cages



Support Cages

Rigid wire design offers maximum durability and support for pulse jet bag houses.

Material

- > Carbon steel
- > Galvanized steel
- > Epoxy coated
- > Stainless Steel

Wires

10, 12, 16
& 20 wires

Design

1, 2, 3 &
4 pieces

We produce Pulse Jet Filter Bags and Cages in the same facility ensuring:

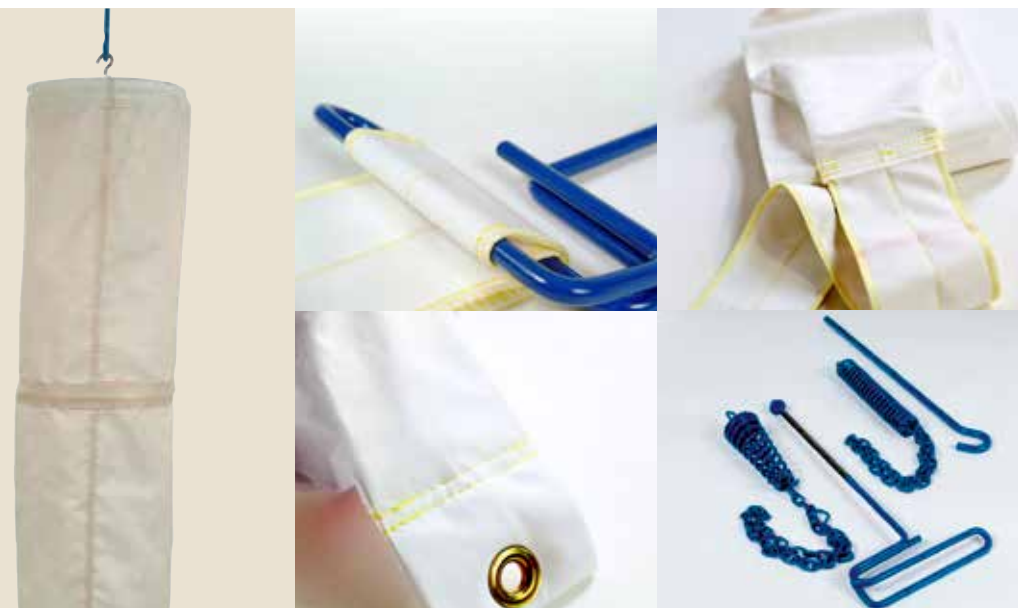
- > Optimal fit, thereby maximizing bag life
- > In time delivery to meet your outage date
- > Reduced transportation costs



Reverse Air Bags & Seamless Tube



Shaker Bags



Specifications & Options

- Brief overview of the different construction options available

| Maximum Continuous Operating Temperature | | | | | | | | | |
|--|---------------|---------|-----------|--------|-------|-------------|------------|-----------|--|
| 170°F | 180°F | 260°F | 275°F | 375°F | 375°F | up to 500°F | 500°F | 500°F | |
| Cotton | Polypropylene | Acrylic | Polyester | Aramid | PPS | P84 | Fiberglass | PTFE Felt | |

Filter Media

Pulse Jet Bags & Filter Support Cages

| | | | | | | | | | | |
|---|--|--------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Filter Bag Tops | Double Beaded Snap Band or Snap Ring | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Flange Top or Flange with Ring | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Raw Edge or Hem | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Filter Bag Bottoms | Single Disc | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Double Disc | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Wear Strip or Wear Skirt | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Filter Cage Tops | Turn Down Flange with or without Venturi installed | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Split Collar | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Split Ring | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Flat Flange | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Filter Cage Bottoms | Welded Pan | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Special finishes and ePTFE membrane laminates available on most filter media options <input checked="" type="checkbox"/> = Available options | | | | | | | | | | |

Reverse Air Bags & Seamless Tube

| | | | | | | | | | | |
|--------------------|--|--------------------------|--------------------------|--------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|-------------------------------------|
| Filter Bag Tops | Compression Band Top (with or without cap) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Filter Bag Bottoms | Cord inserted Cuff | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Double Beaded Snap Band | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Compression Band | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

Shaker Bags

| | | | | | | | | | |
|--------------------|---------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|
| Filter Bag Tops | Strap Top | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Grommet or Loop Top | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Hanger Top | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Multi-Pocket and Envelope | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Filter Bag Bottoms | Double Beaded Snap band | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Cord Inserted Cuff/Hem | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Stitched Flat | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Special finishes and ePTFE membrane laminates available on most filter media options

= Available options

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Filter Media for Your Application

Below, you will find our preliminary suggestions for filter media for each industry. However since site-specific issues might dictate a different media solution, we suggest that you draw upon the expertise of your Midwesco/TDC Filter sales representative to select the optimum media alternative.

APPLICATION

| Industry | Cotton | Polypropylene | Acrylic | Polyester | Aramid | PPS | P84 | Fiberglass | PTFE |
|--------------------------|--------|---------------|---------|-----------|--------|-----|-----|------------|------|
| Asphalt | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Cement | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Chemicals | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Food & Beverage * | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Metals | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Power | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Powder Coating | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Rock Products | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Sand Blasting | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Paper, Pulp, Woodworking | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| OEM | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Misc. Manufacturing | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |

*FDA Compliant as needed

■ = Available options

MEDIA TYPES

| Fiber | Available In | Tensile Strength | Abrasion Resistance | Acid Resistance | Alkali Resistance | Support Combustion | Operating Temp °F |
|--|---|------------------|---------------------|-----------------|-------------------|--------------------|------------------------|
|  Cotton | Woven | ** | ** | * | ** | Yes | 170 |
|  Polypropylene | Woven, Felted | **** | **** | **** | **** | Yes | 180 |
|  Acrylic | Woven, Felted | ** | ** | *** | * | Yes | 260 |
|  Polyester | Woven, Felted, Knit Seamless tube TM | **** | **** | * | * | Yes | 275 |
|  Aramid | Woven, Felted | *** | **** | * | ** | No | 375 |
|  PPS | Woven, Felted | *** | **** | **** | *** | No | 375 |
|  P84 | Woven, Felted | *** | **** | *** | * | No | Up to 500 ^A |
|  Fiberglass | Woven, Felted | **** | * | ** | * | No | 500 |
|  PTFE | Woven, Felted | ** | * | **** | **** | No | 500 |

A) Depending on chemistry and moisture

*Fair **Good ***Very good ****Excellent

FINISHES

| Fabric Finishes | Benefit |
|-----------------|--|
| Singed | Improved cake release |
| Eggshell/glaze | Short-term dust cake release improvement (may impede air flow) |
| Silicone | Improved dust cake release |
| PTFE | Acid degradation properties; oil and water repellant |
| Flame Retardant | Retards combustibility (not flame-proof) |
| Acrylic coating | Improved efficiency and dust cake release (may impede flow in some applications) |
| ePTFE membrane | Reduced emissions, aids in recovery from upset conditions, longer bag life |

| Fiberglass Finishes | Benefits |
|--------------------------|--|
| Silicone, graphite, PTFE | Protects glass yarns from abrasion. For non acidic application, cement and foundry |
| Acid Resistant | Protects glass yarn from acid attack and abrasion. For CFB, carbon black, incinerators, cement, boilers, metals |
| PTFE | Protects glass yarns from abrasion, enhances fiber to fiber resistance. For mild ph conditions base load boilers |
| Chemical Resistant | Protects glass yarns from acid and alkali attack and abrasion |
| ePTFE membrane | Reduces emissions, aids in recovery from upset conditions, longer bag life |

For more information on ePTFE membrane, please see page 16-17

Pleated Bags

- a Cost-effective Alternative to Filter Bags



For more information on construction options, see page 15.

Order a free Total Cost of Ownership Savings Report

Often, economic benefits can be gained by upgrading a filter bag solution to a pleated bag solution. With our savings report based on your specific baghouse details, you receive a full overview of how much a pleated bag solution can:

- > maximize air flow through your baghouse
- > reduce energy and maintenance cost
- > extend the life cycle of your filters
- > lower your emissions

| Category | Current (Filter Bags) | Proposed (Pleated Bags) | Savings |
|--|-----------------------|-------------------------|----------|
| Number/Weight | 4000 | 4000 | 0 |
| Cost/Unit | 100.00 | 100.00 | 0 |
| Weight | 225 | 225 | 0 |
| Volume of Bags | 18.00 | 18.00 | 0 |
| Volume in each bag - FT | 4,417.86 | 1588 | 2,829.86 |
| Volume in vol - FT | | | 0.87 |
| Weight WWT | | | |
| Annual Savings | | | |
| Savings on change-out and purchase of cartridges | 2,205.81 | 4,280.75 | 2,074.94 |
| Savings on process air drop | 3,061.70 | 5,792.00 | 2,730.30 |
| Savings on compressed air | 7.21 | 20.81 | 13.60 |
| Net Total Savings/Year/Baghouse | 6,274.72 | 10,093.56 | 3,818.84 |

Annual Savings (2014)
The savings will increase the additional 10% of our being pleated bags as opposed to current filter bags. When the collector has been changed 3 months, the additional purchase cost will be financed.

midwesco
TDC Filter
TDC Filter



Filter Bags vs. Pleated Bags

- easier installation <
- increased durability <
- better efficiency <
- energy savings <



CONVENTIONAL BAG FILTER



PLEAT PLUS® PLEATED FILTER BAG

MORE INFO, PAGE 26-27

| | | | |
|---------------------------|-----------------|--|------------------|
| Filter length | Up to 33 feet | Max. 80" | Sect. 8 |
| Filter surface area | Conventional | 2-3 times larger than bag filter | Sect. 8 |
| Life cycle | Normal | Excellent | Sect. 2, 4 & 6-9 |
| Installation/maintenance | Labor intensive | 60% lower installation and maintenance costs | Sect. 6, 9 |
| Abrasion/leaks | Can occur | Low abrasion risk - out of the abrasion path | Sect. 6, 9 |
| Emission level | Limited | 58% lower emissions | Sect. 6 |
| Power consumption | Acceptable | 50% Lower energy consumption | |
| Air required for cleaning | As designed | 50% - 70% Less cleaning air consumed | Sect. 1-4 |
| Flow (ACFM) | Limited | 20% higher throughput /ACFM | Sect. 8 |
| Pressure drop | As designed | 20% lower than conventional filter bag | |
| Drop out box | Small | Larger | Sect. 9 |

Testing confirms that spun bonded polyester media allows less than half the emission of felt fabrics

With test parameters using 0.5 micron silica dust, 5:1 air-to-cloth ratio and grain loading of 30 gr/ACFM, outlet emissions were only .0025 gr/ACFM. The 16 oz. polyester felt media outlet emissions was over twice as high with emissions of .0060 gr/ACFM.

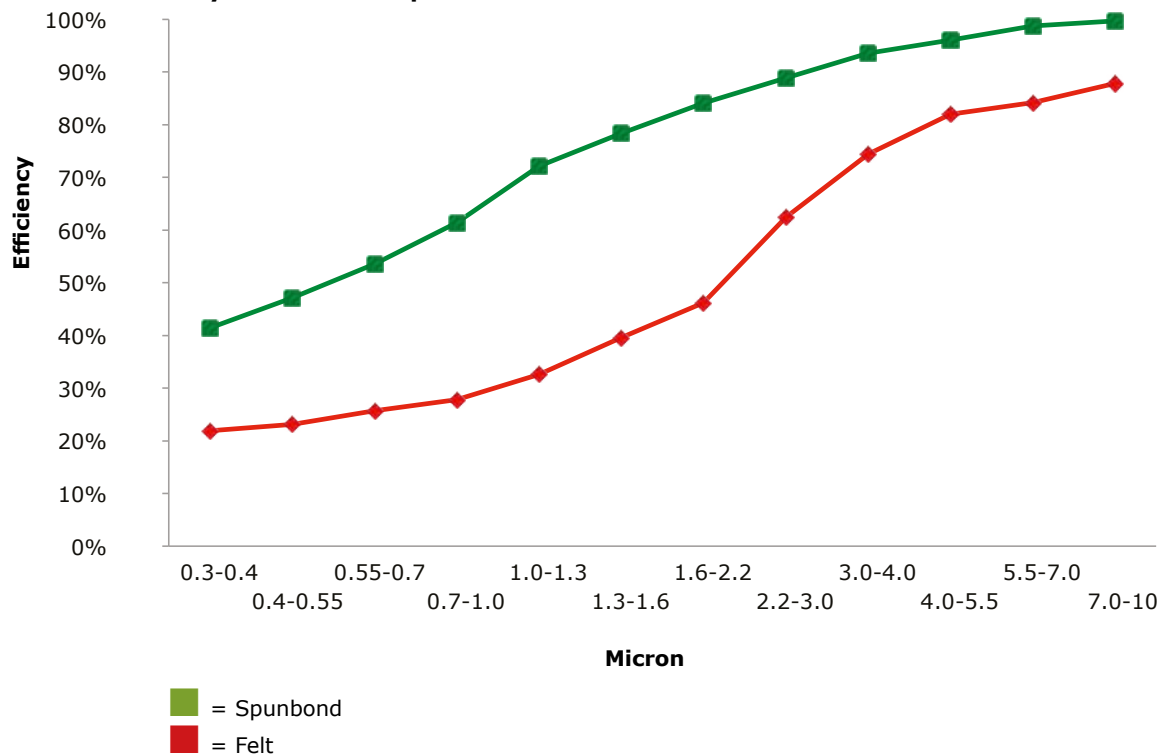
Filter Bags vs. Pleated Bags

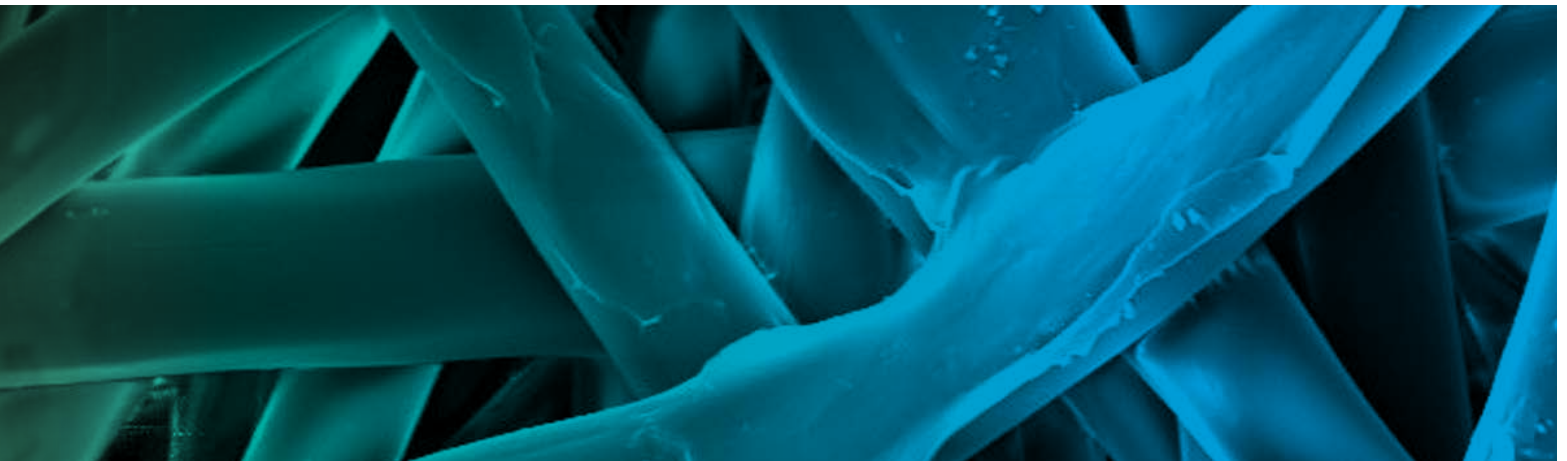
- Filter Media Comparison

SPUNBOND MEDIA VS. POLYESTER FELT ALLOWS:

- > 30% more air through existing dust collector
- > Smaller overall height on new collector
- > Great for restarting old collector
- > Can reduce the number of filters needed
- > Lower energy cost
- > Longer filter life cycle

Polyester Felt vs. Spunbond





POLYESTER FELT



Polyester felt is a thermoplastic filter media. Characteristics of felt:

- > Depth filtration media
- > Low cost
- > Multiple treatments and finishes available

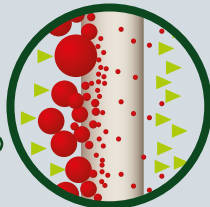
SPUNBOND



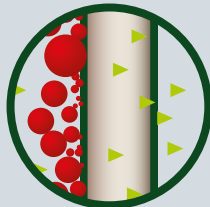
Spunbond (SB) filter media is a non-woven, 100% synthetic spunbond polyester media. It can significantly increase baghouse operating performance due to its key benefits:

- > Surface filtration media
- > Higher efficiencies versus conventional felt
- > High dust release
- > High durability
- > Moisture resistant
- > Lower operating delta P
- > Higher throughput /ACFM
- > Multiple finishes and treatments are available

DEPTH



SURFACE



DEPTH VS. SURFACE FILTRATION

The benefits of surface filtration are:

- > Less accumulation of dust
- > Less pressure drop
- > Longer filter life cycle

We take the dust out of industry®

Wide Range of High Quality Pleated Bags

- Manufactured by skilled workers in company-owned plants in the U.S. & Europe



PleatPlus®
Screw Top
> Dirty side removal

PleatPlus®
8TL2
> Clean side removal



PleatPlus®
Family
> Dirty and clean side removal

PleatPlus®
Universal
& Long Boot
> Dirty side removal



PleatPlus®
Seal-Rite II
> Clean side removal



PleatPlus®
Seal-Tite II
> Dirty side removal



PleatPlus®
IntegraSeal™
> Clean side removal
> IntegraSeal fits
tubesheet hole sizes
from 4.625" to 8.75"













Specifications & Options

- Brief overview of the different construction options available

Maximum operating temperature

200°F 275°F 375°F

| Filter Media | | | Spunbond Polyester | Spunbond Polyester | > PPS > Aramid |
|--------------|--|---|-------------------------------------|-------------------------------------|-------------------------------------|
| Top | Top & bottom loader |  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | IntegraSeal™ |  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Seal-Tite II |  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Inner core | Polypropylene |  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Metal |  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Bottoms | Low temperature integrated molded bottom |  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| | High temperature integrated molded bottom |  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Straps | Weldtech™ - Ultrasonic welding minimizes trapping of dust behind strap |  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| | Glued |  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| | Rivited overlap |  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

= Available options

Filter Media for your Application

Below, you will find our preliminary suggestions for pleated filter media for each industry. However since site-specific issues might dictate a different media solution, we suggest that you draw upon the expertise of your Midwesco/TDC Filter sales representative to select the optimum media alternative.

| Industry | Bond- Maxx™ | SB | SB-HO | SB-ME | SB-TX | CB-TX | AR | AR-TX | PS | PS-TX |
|--------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Asphalt | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Cement | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Chemicals | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Food & Beverage * | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Metals | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Power | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Powder Coating | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Rock Products | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Sand Blasting | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Paper, Pulp, Woodworking | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| OEM | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Misc. Manufacturing | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

FDA Compliant as needed

= Available options

Standard Product Guide - Pleated

| Name | Material | Treatment | MERV Rating |
|-----------|------------------------------|--------------------------|-------------|
| BondMaxx™ | 100% synthetic | - | 10 |
| SB | 100% synthetic | - | 12 |
| SB-HO | 100% synthetic | Hydrophobic & oleophobic | 11 |
| SB-ME | 100% synthetic | Conductive | 11 |
| SB-TX | 100% synthetic | ePTFE membrane | 16 |
| CB-TX | 100% synthetic | Conductive+ePTFE | 16 |
| AR | 100% Aramid High temperature | - | - |
| AR-TX | 100% Aramid High temperature | ePTFE membrane | 16 |
| PS | 100% PPS High temperature | - | 10 |
| PS-TX | 100% PPS High temperature | ePTFE membrane | 16 |

HO = hydrophobic and oleophobic treatment = water and oil repellent

TX = ePTFE membrane = Media contains a membrane - the most dust resistant solution available



| Max. continuous operating temperature F | Oil/water | Hydrolysis | Acid | Alkali | Dust release |
|---|-----------|------------|------|--------|--------------|
| 375 | ** | * | ** | * | *** |
| 375 | ** | * | ** | * | *** |
| 375 | **** | * | ** | * | *** |
| 375 | ** | * | ** | * | *** |
| 275 | *** | * | ** | ** | **** |
| 275 | *** | ** | ** | * | **** |
| 275 | ** | * | ** | ** | ** |
| 275 | *** | * | ** | ** | **** |
| 275 | * | **** | **** | *** | * |
| 275 | *** | **** | **** | *** | **** |

*Fair **Good ***Very good ****Excellent

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ePTFE Membrane Technology

- Helps you meet EPA requirements



ePTFE MEMBRANE



ePTFE MEMBRANE TECHNOLOGY EQUALS INCREASED EFFICIENCY

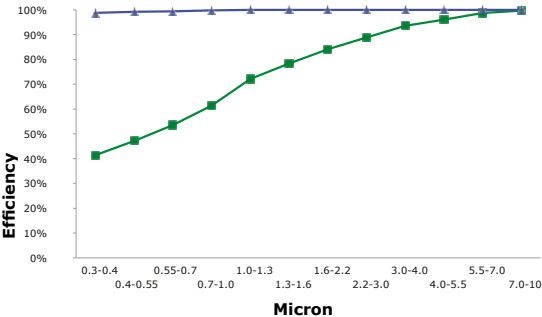
High durability, high efficiency, ePTFE membrane helps meet EPA requirements (PM2.5, MACT, NESHAP).

ePTFE Membrane will benefit Total Cost of Ownership as a result of:

- > Reduced emissions (PM10, PM2.5 and Sub-Micron PM)
- > Lower operating differential pressure
- > Longer effective life cycle of bags and pleated bags
- > Aids in recovery from upset conditions such as moisture, boiler tube leaks, etc.
- > Provides a chemical barrier to particulate matter
- > Full collection efficiency upon start up as a result of high initial efficiency
- > Reduced consumption of cleaning air
- > Fan energy savings
- > Higher throughput capabilities reduce capital costs as a smaller dust collector can match the dust collection demand



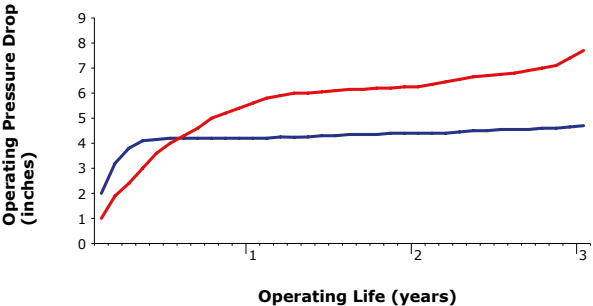
Spunbond efficiency with and without ePTFE membrane



- = Spunbond with ePTFE membrane
- = Spunbond

PPS Felt pressure drop comparison with and without ePTFE membrane

Actual Field Data – 565 MW Boiler



- = PPS Felt w/ePTFE membrane
- = PPS Felt

We take the dust out of industry®

VALUE ADDED SERVICES

In addition to filter bags, pleated bags and cages, we offer multiple value-added services including:

- > Baghouse inspection
- > Laboratory testing services including Filter Analysis
- > Total Cost of Ownership Savings Report
- > Filter change-out services
- > Baghouse renovation

Baghouse Inspections, Change-out & Maintenance Services

We provide full inspection and change-out services. Whether your equipment needs routine, preventative, or emergency maintenance services, Midwesco Filter Resources and TDC Filter has experienced crews that are OSHA, MSHA, and HAZWOPER trained. Also, we are ISNetworld® qualified.

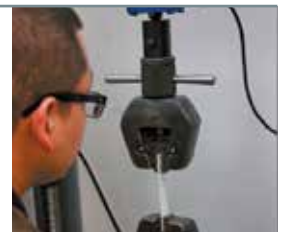


Laboratory Testing & Filter Analysis

With our strong technical team and our laboratory facilities, we act as a consultant to our customers and advise about the optimum filter solution for specific applications with the aim to obtain lower Total Cost of Ownership.

In our lab we provide testing such as

- > Media physicals
- > Filter life expectancy evaluations
- > Reverse engineering
- > Failed filter analysis
- > Contaminant analysis
- > Particle sizing
- > Custom testing based on individual requirements



Total Cost of Ownership Savings Report

Our savings report based on your specific baghouse details gives you full overview of:

- > How you can maximize air flow through your baghouse
- > How to reduce energy and maintenance cost
- > How to maximize the life cycle of your filters
- > How to lower your emissions. *Order your free report with your sales rep.*

| Item | Quantity | Unit Price | Total Price |
|--------------------|--------------------------------------|------------|-------------|
| Filter Media | 1000 | 1.50 | 1500.00 |
| Filter Housing | 50 | 30.00 | 1500.00 |
| Filter Bags | 2000 | 0.75 | 1500.00 |
| Filter Frames | 100 | 15.00 | 1500.00 |
| Filter Seals | 500 | 3.00 | 1500.00 |
| Filter Supports | 200 | 7.50 | 1500.00 |
| Filter Valves | 100 | 15.00 | 1500.00 |
| Filter Actuators | 50 | 30.00 | 1500.00 |
| Filter Motors | 25 | 60.00 | 1500.00 |
| Filter Controllers | 10 | 150.00 | 1500.00 |
| Filter Sensors | 50 | 30.00 | 1500.00 |
| Filter Actuators | 25 | 60.00 | 1500.00 |
| Filter Motors | 10 | 150.00 | 1500.00 |
| Filter Controllers | 5 | 300.00 | 1500.00 |
| Filter Sensors | 25 | 60.00 | 1500.00 |
| Filter Actuators | 10 | 150.00 | 1500.00 |
| Filter Motors | 5 | 300.00 | 1500.00 |
| Filter Controllers | 2 | 750.00 | 1500.00 |
| Filter Sensors | 10 | 150.00 | 1500.00 |
| Filter Actuators | 5 | 300.00 | 1500.00 |
| Filter Motors | 2 | 750.00 | 1500.00 |
| Filter Controllers | 1 | 1500.00 | 1500.00 |
| Filter Sensors | 5 | 300.00 | 1500.00 |
| Filter Actuators | 2 | 750.00 | 1500.00 |
| Filter Motors | 1 | 1500.00 | 1500.00 |
| Filter Controllers | 0.5 | 3000.00 | 1500.00 |
| Filter Sensors | 2 | 750.00 | 1500.00 |
| Filter Actuators | 1 | 1500.00 | 1500.00 |
| Filter Motors | 0.5 | 3000.00 | 1500.00 |
| Filter Controllers | 0.25 | 6000.00 | 1500.00 |
| Filter Sensors | 1 | 1500.00 | 1500.00 |
| Filter Actuators | 0.5 | 3000.00 | 1500.00 |
| Filter Motors | 0.25 | 6000.00 | 1500.00 |
| Filter Controllers | 0.125 | 12000.00 | 1500.00 |
| Filter Sensors | 0.5 | 3000.00 | 1500.00 |
| Filter Actuators | 0.25 | 6000.00 | 1500.00 |
| Filter Motors | 0.125 | 12000.00 | 1500.00 |
| Filter Controllers | 0.0625 | 24000.00 | 1500.00 |
| Filter Sensors | 0.25 | 6000.00 | 1500.00 |
| Filter Actuators | 0.125 | 12000.00 | 1500.00 |
| Filter Motors | 0.0625 | 24000.00 | 1500.00 |
| Filter Controllers | 0.03125 | 48000.00 | 1500.00 |
| Filter Sensors | 0.125 | 12000.00 | 1500.00 |
| Filter Actuators | 0.0625 | 24000.00 | 1500.00 |
| Filter Motors | 0.03125 | 48000.00 | 1500.00 |
| Filter Controllers | 0.015625 | 96000.00 | 1500.00 |
| Filter Sensors | 0.0625 | 24000.00 | 1500.00 |
| Filter Actuators | 0.03125 | 48000.00 | 1500.00 |
| Filter Motors | 0.015625 | 96000.00 | 1500.00 |
| Filter Controllers | 0.0078125 | 192000.00 | 1500.00 |
| Filter Sensors | 0.03125 | 48000.00 | 1500.00 |
| Filter Actuators | 0.015625 | 96000.00 | 1500.00 |
| Filter Motors | 0.0078125 | 192000.00 | 1500.00 |
| Filter Controllers | 0.00390625 | 384000.00 | 1500.00 |
| Filter Sensors | 0.015625 | 48000.00 | 1500.00 |
| Filter Actuators | 0.0078125 | 96000.00 | 1500.00 |
| Filter Motors | 0.00390625 | 384000.00 | 1500.00 |
| Filter Controllers | 0.001953125 | 768000.00 | 1500.00 |
| Filter Sensors | 0.0078125 | 48000.00 | 1500.00 |
| Filter Actuators | 0.00390625 | 96000.00 | 1500.00 |
| Filter Motors | 0.001953125 | 384000.00 | 1500.00 |
| Filter Controllers | 0.0009765625 | 768000.00 | 1500.00 |
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| Filter Actuators | 0.001953125 | 96000.00 | 1500.00 |
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| Filter Controllers | 0.00048828125 | 768000.00 | 1500.00 |
| Filter Sensors | 0.001953125 | 48000.00 | 1500.00 |
| Filter Actuators | 0.0009765625 | 96000.00 | 1500.00 |
| Filter Motors | 0.00048828125 | 384000.00 | 1500.00 |
| Filter Controllers | 0.000244140625 | 768000.00 | 1500.00 |
| Filter Sensors | 0.0009765625 | 48000.00 | 1500.00 |
| Filter Actuators | 0.00048828125 | 96000.00 | 1500.00 |
| Filter Motors | 0.000244140625 | 384000.00 | 1500.00 |
| Filter Controllers | 0.0001220703125 | 768000.00 | 1500.00 |
| Filter Sensors | 0.00048828125 | 48000.00 | 1500.00 |
| Filter Actuators | 0.000244140625 | 96000.00 | 1500.00 |
| Filter Motors | 0.0001220703125 | 384000.00 | 1500.00 |
| Filter Controllers | 0.00006103515625 | 768000.00 | 1500.00 |
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| Filter Actuators | 0.0001220703125 | 96000.00 | 1500.00 |
| Filter Motors | 0.00006103515625 | 384000.00 | 1500.00 |
| Filter Controllers | 0.000030517578125 | 768000.00 | 1500.00 |
| Filter Sensors | 0.0001220703125 | 48000.00 | 1500.00 |
| Filter Actuators | 0.00006103515625 | 96000.00 | 1500.00 |
| Filter Motors | 0.000030517578125 | 384000.00 | 1500.00 |
| Filter Controllers | 0.0000152587890625 | 768000.00 | 1500.00 |
| Filter Sensors | 0.00006103515625 | 48000.00 | 1500.00 |
| Filter Actuators | 0.000030517578125 | 96000.00 | 1500.00 |
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| Filter Actuators | 0.00000762939453125 | 96000.00 | 1500.00 |
| Filter Motors | 0.000003814697265625 | 384000.00 | 1500.00 |
| Filter Controllers | 0.0000019073486328125 | 768000.00 | 1500.00 |
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| Filter Actuators | 0.00000095367431640625 | 96000.00 | 1500.00 |
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| Filter Controllers | 0.00000001490116119384765625 | 768000.00 | 1500.00 |
| Filter Sensors | 0.000000059604644775390625 | 48000.00 | 1500.00 |
| Filter Actuators | 0.0000000298023223876953125 | 96000.00 | 1500.00 |
| Filter Motors | 0.00000001490116119384765625 | 384000.00 | 1500.00 |
| Filter Controllers | 0.000000007450580596923828125 | 768000.00 | 1500.00 |
| Filter Sensors | 0.0000000298023223876953125 | 48000.00 | 1500.00 |
| Filter Actuators | 0.00000001490116119384765625 | 96000.00 | 1500.00 |
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| Filter Controllers | 0.0000000037252902984619140625 | 768000.00 | 1500.00 |
| Filter Sensors | 0.00000001490116119384765625 | 48000.00 | 1500.00 |
| Filter Actuators | 0.000000007450580596923828125 | 96000.00 | 1500.00 |
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| Filter Actuators | 0.0000000004656612873077392578125 | 96000.00 | 1500.00 |
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| Filter Motors | 0.00000000011641532182694814453125 | 384000.00 | 1500.00 |
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| Filter Controllers | 0.0000000000291038304567370361328125 | 768000.00 | 1500.00 |
| Filter Sensors | 0.000000000232830643653 | | |

Optimize Filter Performance with our Proven Accessories

BROKEN BAG DETECTOR

PCME Electrodynamic™ technology allows for remote reporting of the condition of single and multi compartment filters. Emission warning alarms prevent dust emission levels to breach regulatory limits and thereby eliminates the lost production time normally associated with unscheduled plant shutdowns.



LEAK SEEKER®

Quick and easy test for leaks in your system

Utilizing Leak Seeker® as part of your regular baghouse maintenance program helps you avoid costly unscheduled shutdowns. Our Leak Seeker® is ideal for preventive maintenance use and offers a low cost, effective way of locating broken filter bags or pleated bags, cracked tube sheets or faulty seals.

The Leak Seeker® system contains an illuminating light and tracing powder used to reveal the exact location and severity of leakage.

- > Supplied in 5 lb., 25 lb., Case of 4 x 5 lb. and 300 lb. containers
- > Black lights available are flash light, spot light, lantern and wand



HANGERS & SPRING ASSEMBLIES FOR FILTER BAGS

Replacement of worn, bent or poorly designed hanging assemblies in reverse air and shaker systems can extend filter bag life and improve cleaning and overall equipment performance.

Options:

- > Linear, conical or barrel springs
- > 17-7 ph stainless or chrome silica wire in a variety of dimensions
- > J-bolts and double drawbar assemblies
- > Pins and washers
- > Strap and loop hangers





Accessories

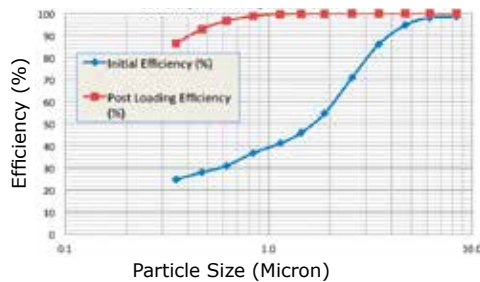
PREKOTE®

Increases initial efficiency & protects filter during start up

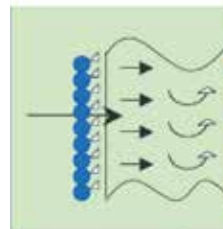
- > Creates a highly permeable, protective layer on the surface of the filter media and increases filter performance
- > Improves dust cake release
- > Ensures longer filter life
- > Ideal for applications where moisture and oil are present
- > Prekote® is chemically inert, non-toxic and pH neutral
- > Does not contain lime or diatomaceous earth
- > Supplied in 25 lb., 450 lb. super sacks or via bulk truck
- > Can be pre-applied to pleated bags and cartridges



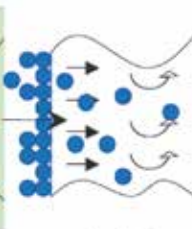
ASHRAE 52.2
Initial Efficiency Comparison
650 CFM, PreKote®: Expanded Perlite



With PreKote®



Without PreKote®



▲▲ PreKote® ● Particulate → Airflow

ACCESSORIES FOR BAGHOUSES

We are the total solution provider for original equipment replacement parts for baghouses:

- > Pulse Valves and Repair Kits
- > Air Headers
- > Pressure Gauges
- > Bulkhead connectors
- > Door Gasket
- > Clamps
- > Sonic Horns
- > Timers
- > Tube Line Cleaner™ (TLC)
- > Mobile Analyzer
- > Go-Co Nozzles
- > Rotary Air Locks and Dump Valves
- > Bag Cups and Venturis
- > Etc.



Case Studies



ePTFE Membrane solves Outlet Emission Breach in Baghouse

PROBLEM

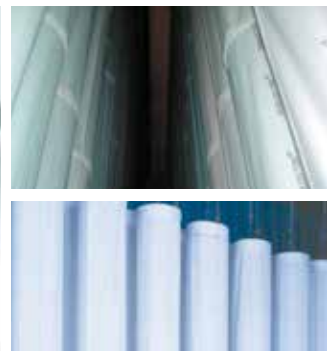
A 475MW boiler with an ESP needed major upgrades or replacement to meet present and future emissions and regulation requirements.

SOLUTION

The ESP casing was converted to a 16 module pulse jet system with Midwesco's 21 oz. woven fiberglass, acid resistant, ePTFE membrane filter bags. Total amount of filters: 16,112.

RESULT

The new solution provided significant cost savings when compared to the alternative; a complete structural replacement. Also, the stack opacity is now close to zero in accordance with the compliance strategy for PM 2.5 fine particulate control. Filter bag life guarantee was 3 years.



Longer Life, Lower Cost Seamless Tube provided up to 15% reduction in power and increased filtration efficiency

PROBLEM

A mini-mill needed filter bags for their newly installed positive pressure, reverse-gas cleaned baghouse on their EAF shop to handle 1,115,000 ACFM of flow with KO61 dust entrained. The permit stated .0032 gr/DSCF particulate capture efficiency.

SOLUTION

Midwesco supplied and installed 4200 Seamless Tube® RT02 filter bags and hanging assemblies. During installation and pre-start up, leak seeker and PreKote® was applied. Midwesco handled pre-start up operations and assisted in establishing the most efficient cleaning cycles.

RESULT

- > Baghouse tested at .0008 gr/DSCF initially
- > Five years after start up, the baghouse re-tested at .0013 gr/DSCF
- > Six years after commissioning, the baghouse operates at 4" - 5.5" DP with no visible emissions



Coal Fired Industrial Boiler Limitations solved by upgrading to PleatPlus® Pleated Bags and New Valves

Region: Southwest US

PROBLEM

A load-limited boiler could not sustain full load operations. The boiler was running at 8" delta P

SOLUTION

Midwesco/TDC Filter provided a turnkey solution which included:

- > Inspection of the plant and the problem
- > Assistance in selecting the ideal filter design and media to the specific application and conditions
PleatPlus® pleated bags with PPS media and ePTFE membrane solved the problem
- > Offline installation of filters
- > Installation of Mecair® high-capacity pulse valves increased the cleaning capacity by more than 47%
- > Operational guidance and assistance

RESULT

The boiler operates at maximum capacity. Maximum output has resulted in lower cost-per-ACFM at the baghouse.

- > 39% increase in flow - from 287,000 to 401,000 ACFM
- > 14.7% drop in average module delta P
- > 4.2% reduction in opacity per ACFM
- > Exceeded estimated performance

GUIDE:

OPTIMIZE THE PERFORMANCE OF YOUR COLLECTOR



Underperforming pulse jet baghouses are usually the result of high dust loading, inefficient cleaning systems - or a combination of both. Left unchecked, these problems can result in process bottlenecks and increased operating costs. Below are some steps you can take to avoid this from happening. If you need assistance, we have the unique expertise to identify and solve baghouse problems.

Recommended General Operation parameters:

| | |
|----------------------|--|
| Pressure | 90-100 PSI (May vary depending on material type) |
| Frequency (off time) | 20 seconds or minimum time to maintain the desired differential pressure |
| Duration (on time) | 150 milliseconds |



1 Reservoir

Poor filter cleaning can be the result of undersized or restricted cleaning system components. It is important to make sure that there are not any restrictions starting from the compressor all the way to the reservoir. Also, ensure that your header tank size matches your cleaning requirements.



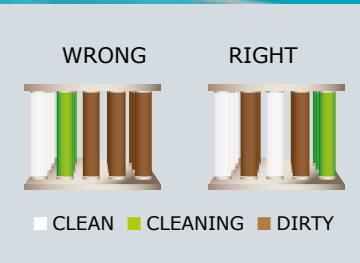
2 Cleaning Air

Ensure better cleaning with tanks that are kept free of moisture and debris as they can substantially impact the ability to clean the filters.



3 Pulse Frequency

The pulsing frequency can never be any faster than the reservoir can recover to full pulsing pressure.



4 Pulse Sequence

The pulse sequence should be adjusted to ensure that newly cleaned filters do not take in dust from the neighboring filter being pulsed. Staggering the firing order helps reduce cross contamination.



Please notice:
Some collectors may operate successfully under less stringent settings, while other collectors may fail under more conservative settings.

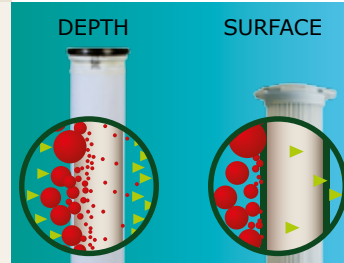
5 Hopper

Should not be used for storage. Evacuation equipment (rotary valves, screw conveyors, etc.) should be sized to unload hopper before accumulation occurs. Units with slide gates should be left open and equipped with sealed drum adapters.



6 Emission/bleed through

Due to emission regulations sometimes enforcing a change of filter media, still more dust collector owners seize this opportunity to upgrade to a more efficient filter media, which helps filter even the smallest particles thereby providing users the potential to recycle more of their valuable product and/or meet the required reduced emissions requirements. To reduce emission/bleed through, advantages can be achieved by upgrading from conventional filter bags with spunbond media or media with an ePTFE membrane.



7 Choice of media

All dust types have specific characteristics and requires different handling. Therefore, it is often not enough to use a plain polyester media. Purchasing an enhanced treated/coated media (for example ePTFE membrane, HO treatment or antistatic surface) often turns out to be profitable as a result of better pulse cleaning.

Some of the factors that influence the right choice of media are humidity, temperature, conductivity and acid.



8 Air flow

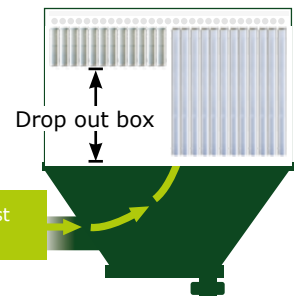
Several issues can cause reduced air flow in the dust collector. The most common problem is the balance between the cleaning of filters and dust loading into the collector. These factors strongly influence the amount of airflow the system can handle. If you need to handle more ACFM, more filter area is usually required. Some customers choose to purchase longer bags or a new collector with more bags. Others choose a pleated bag solution which increases the filter area.



9 Drop out box

The drop out box is the distance between the bottom of the filters and the hopper. The greater the distance, the better the conditions are for the heavier dust particles to be dropped from the airflow before contacting the filter surface area. To optimize the drop out box, install pleated bags which are shorter, as well as having more surface area. The increased drop out box removes the filter from the abrasion zone.

High velocity airflow containing dust particles enters bag collector



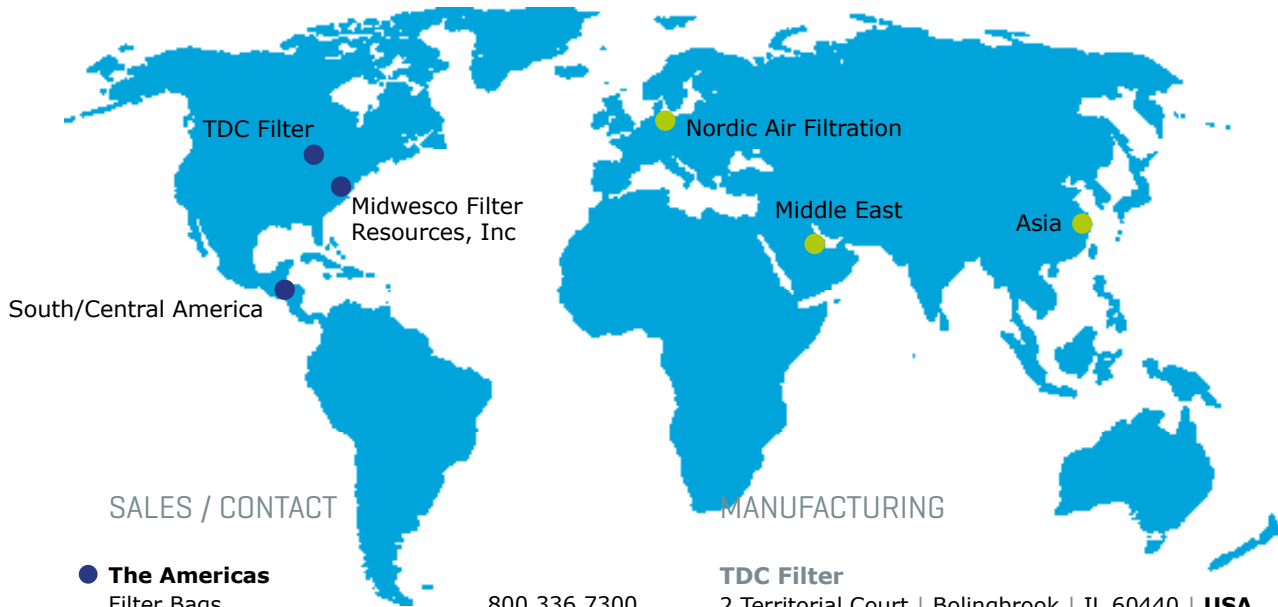
We take the dust out of industry®

midwesco
Filter Resources, Inc.



TDC Filter
a midwesco® company

MartinPrstedt.dk



SALES / CONTACT

● **The Americas**

Filter Bags 800 336 7300
Pleated Bags 800 424 1910

● **Europe, Middle East, Africa, Asia**

Phone +45 54 95 13 90

MANUFACTURING

TDC Filter

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