Efficient Filtration Solutions for Baghouses

in the Cement, Minerals, Steel and Chemicals Industry

NORDIC AIR FILTRATION
Member of the Hengst Group

We take the dust out of industry™

Specialized in Baghouse filtration for all industries since 1991

Nordic Air Filtration – member of the Hengst Group - is a high technology filter manufacturer supplying filters for Resellers, End-users and OEMs throughout the world. With a range of more than 4000 different filters and 20+ types of high quality filter medias, we provide air filtration solutions for various industries and dust types, including abrasive, toxic and explosive dust. In addition to that, we offer customized filter solutions and on-site technical field support.

At our highly skilled R&D departments in Münster, Germany, and Nakskov, Denmark, we ensure certified high quality products in line with our primary goal: to continuously develop innovative filtration solutions that increase performance and reduce cost for our customers.

Nordic Air Filtration became a member of the Hengst Group in 2016. Hengst - www.hengst.com - is an international recognized manufacturer and supplier for the automotive and engines industry as well as a producer of a wide variety of filtration applications in the industrial and consumer goods sectors.

The joining forces with one of the giants within filtration, have also widened our global activities, and Nordic Air Filtration now has divisions in Chicago, North America, Kunshan, China and Fujairah, United Arab Emirates. Our strategy is to be as close to our customers and providing the best service and support as possible.

In this brochure we focus on:

Cement
Solutions for large quantities of abrasive dust particles

Chemicals
Solutions that meet strict industry regulations

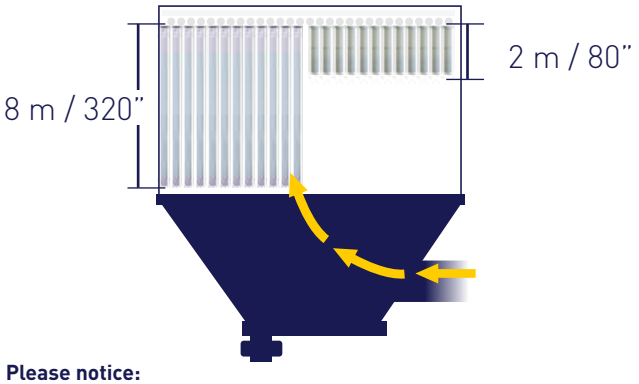
Metals / Aluminum
Solutions for high temperature and abrasive dust particles

Minerals
Solutions for high purity engineered products

Pleated Bags an alternative to Filter Bags

Often, economic and environmental benefits can be gained by upgrading a filter bag to a pleated bag solution. With our Total 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
- Maximize the life cycle of your filters
- Lower your emissions



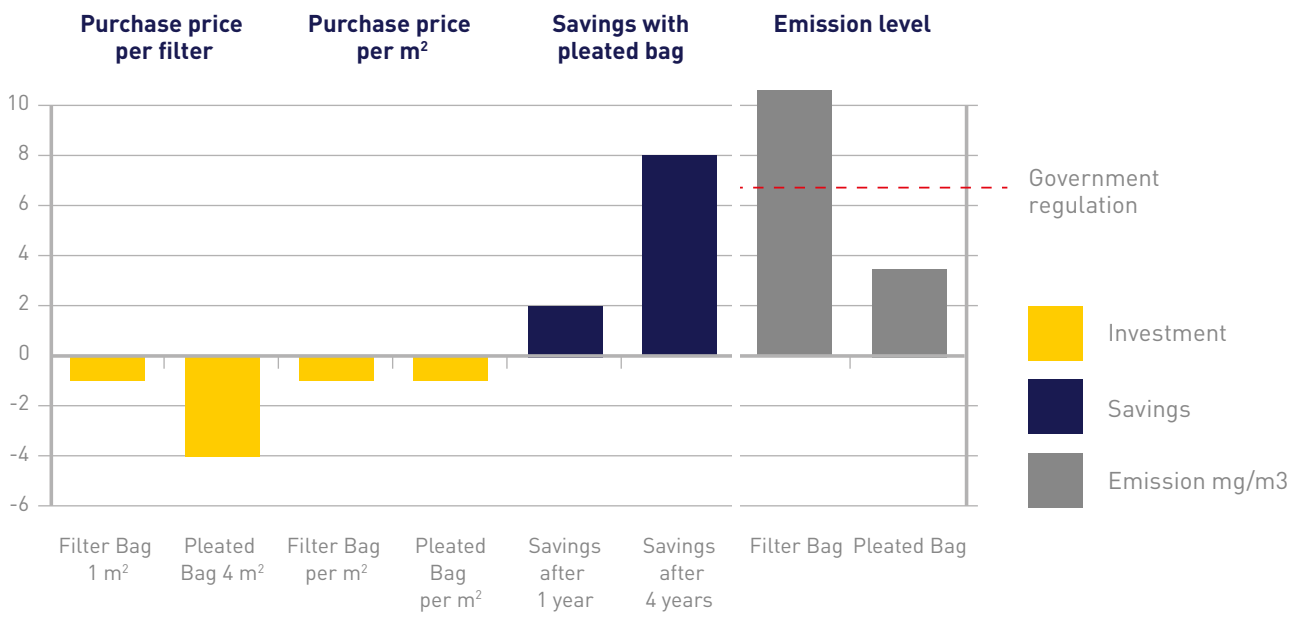
Please notice:
A 2 m / 80" Pleated Bag can substitute a 8 m / 320" Filter Bag. Shorter filters optimize the drop out box area - see more tips for optimizing your collector on p. 19.

Filter Bags vs. Pleated Bags	Filter Bags	Pleated Bag
Filter length	Up to 10 meter / 400"	Max. 2 meter / 80"
Filter surface area	Conventional	2-4 Times larger than bag filter
Life cycle	Normal	Excellent
Installation/maintenance	Labor intensive	60% Lower installation and maintenance costs
Abrasion/Leaks	Can occur	Low abrasion risk - out of the abrasion path
Emission level	Limited	58% Lower emissions
Energy consumption	Acceptable	50% Lower energy consumption
Air required for cleaning	As designed	50% - 70% Less cleaning air consumed
Flow	Limited	20% Higher throughput
Pressure Drop	As designed	20% Lower than conventional filter bag
Drop out box	Small	Larger = less dust re-entrainment on filter

Get higher efficiency and economic benefits

As an isolated purchase cost the pleated bag is more expensive than a filter bag. But the price per m^2 of media is the same and the operational costs and overall advantages which can be obtained by using pleated bags are significant.

Below illustration gives you a simple but accurate view of the financial and environmental impact of the pleated bag technology.



Weltech

Weltech Technology ensures 100 % pleat alignment with no use of glue. An ultrasonic welding of the retainer band, to each pleat with no adhesive, makes it non collapsible even at high vacuum use. The perfect pleat spacing equals better filter cleaning performance and more even airflow.

Wide range of Pleated Bag Filters

Based on our wide range of high quality products and many years of filtration expertise including years of experience supplying efficient filtration solutions to the minerals and cement industry, we are able 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.

Pleated Bags

- 2 m long, hole sizes in the range 115-208 mm / 4.50-8.19"
- Bottom & Top Loader
- High Temp. Steel Top Loader

Increased durability, better efficiency, energy savings, reduced emission levels and easier installation are some of the advantages of the Pleated Bag and can be found in high temperature, top or bottom loaded versions.

100% recyclable

Please notice:
Also comes in a fully recyclable version.

Multifit

- Clean side removal cartridge
- Fits holes in the range 151-167 mm / 5.94-6.60"
- Adapter ring enables easy installation

Our Multifit fits into several tube sheet holes with same type of filter – enabling easy installation and retrofit into existing baghouses without any modifications.

Guide: customize your filter

at Nordic Air Filtration it is possible to customize your filter so it fits your needs. You have many possibilities and we are very flexible and eager to help you find the right solution to your specific requirements.

		Operating/Peak temperature 70°C/ 80°C 160°F/ 175°F	 120°C/ 140°C 250°F/ 285°F	 180°C/ 200°C 350°F/ 390°F
		Spunbond Polyester	Spunbond Polyester	PPS / mAramide
01 Filter media	The pleats equal 2-4 times more filter area compared to filter bags Can be equipped with Nordic Air Filtration's wide selection of filter media			
02 Top Cap	**Top Loader (CPB)** | Mounted with steel plug	■		
	Multifit Top Loader (CMF) | Mounted with adapter ring	■	■	
	Steel Top Loader (CPBS) | Mounted with snap ring	■	■	■
	Bottom Loader (CBLPB) | Mounted with jubilee clip/hose clamp	■		
03 Inner Core	**Polypropylene**	■		
	Metal (galvanized or stainless)	■	■	■
04 Bottom Cap	**Integrated molded bottom**	■		
	PA6 polyamide (Multifit - CMF)	■	■	
	Metal (galvanized or stainless)	■	■	■
05 Outside Straps	**Weltech** | Ultrasonic welding minimizes trapping of dust behind strap and is a non-glue solution	■	■	■
	Glued	■		
	Ryton	■	■	■

■ = Available options

The big difference is in the media

Bag Media

Polyester felt

A thermoplastic filter media.
Characteristics of felt:

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

Pleated Bag Media

Spunbond

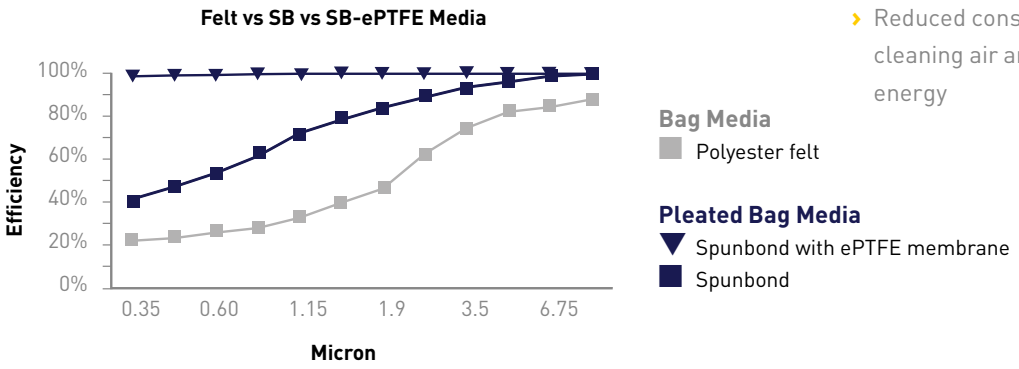
A non-woven, 100% synthetic spunbond polyester media:

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

Spunbond with ePTFE Membrane

ePTFE Membrane on a non-woven, 100% synthetic spunbond polyester media:

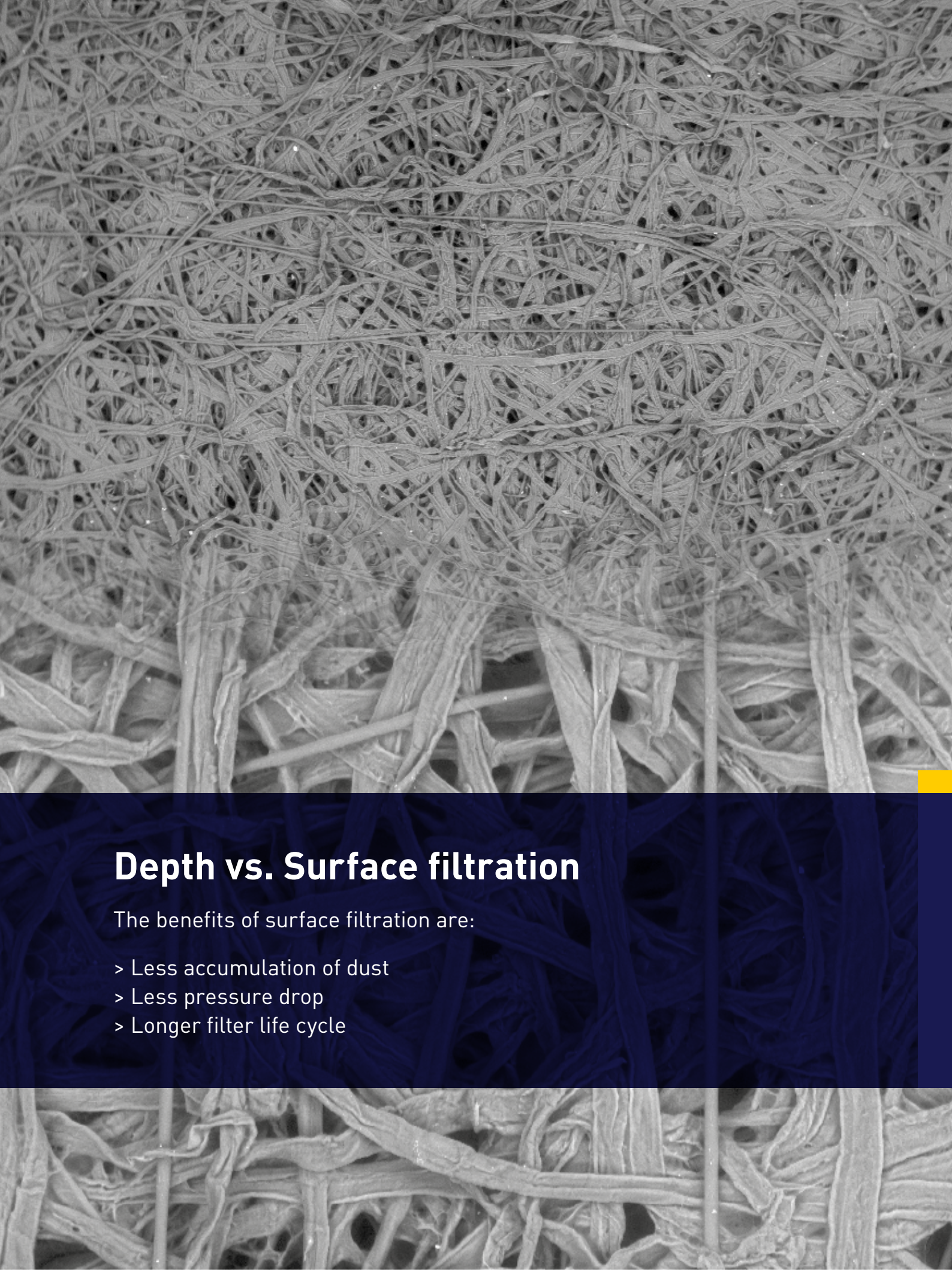
- Reduced emissions (PM10, PM2.5 and Sub-Micron PM) and high initial efficiency
- Lower operating differential pressure
- Longer effective life cycle of bags and pleated bags
- Aids in recovery from upset conditions such as moisture, incomplete combustion, etc.
- Provides a chemical barrier to particulate matter
- Reduced consumption of cleaning air and savings on fan energy



Treatments

Spunbond with PTFE coating: Oil and water repellent | Improved cleaning, also with discontinuous processes | Ideal for fine agglomerating dusts as well as for other challenging processes

Spunbond with Conductive / Anti-static treatment: For use in ATEX environments | Allowing the dissipation of any charge which may have built up on the filter media



Depth vs. Surface filtration

The benefits of surface filtration are:

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

Filter accessories

Nordic Air Filtration supplies a variety of filter accessories, for prolonging filter life time:
Valves | Header Tanks | Leak detection powder | PreTreat.
Contact our sales team for further information or visit our site at www.nordic-air-filtration.com

Other products from Nordic Air Filtration

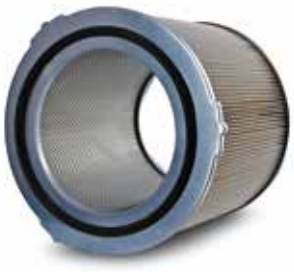
at Nordic Air Filtration we take pride in serving your every need, below you find a selection of our most popular filters

DIN Cartridge
Cylindrical or Conical

Jet Cartridge
3-lug or 4-lug

Square End cap
Galvanized or stainless

Clean Side Cartridge
Cylindrical or Conical



Curly Bracket
In various lengths

Thread
Cylindrical or Conical

Flat Cell
Some models also available in Tip2Tip

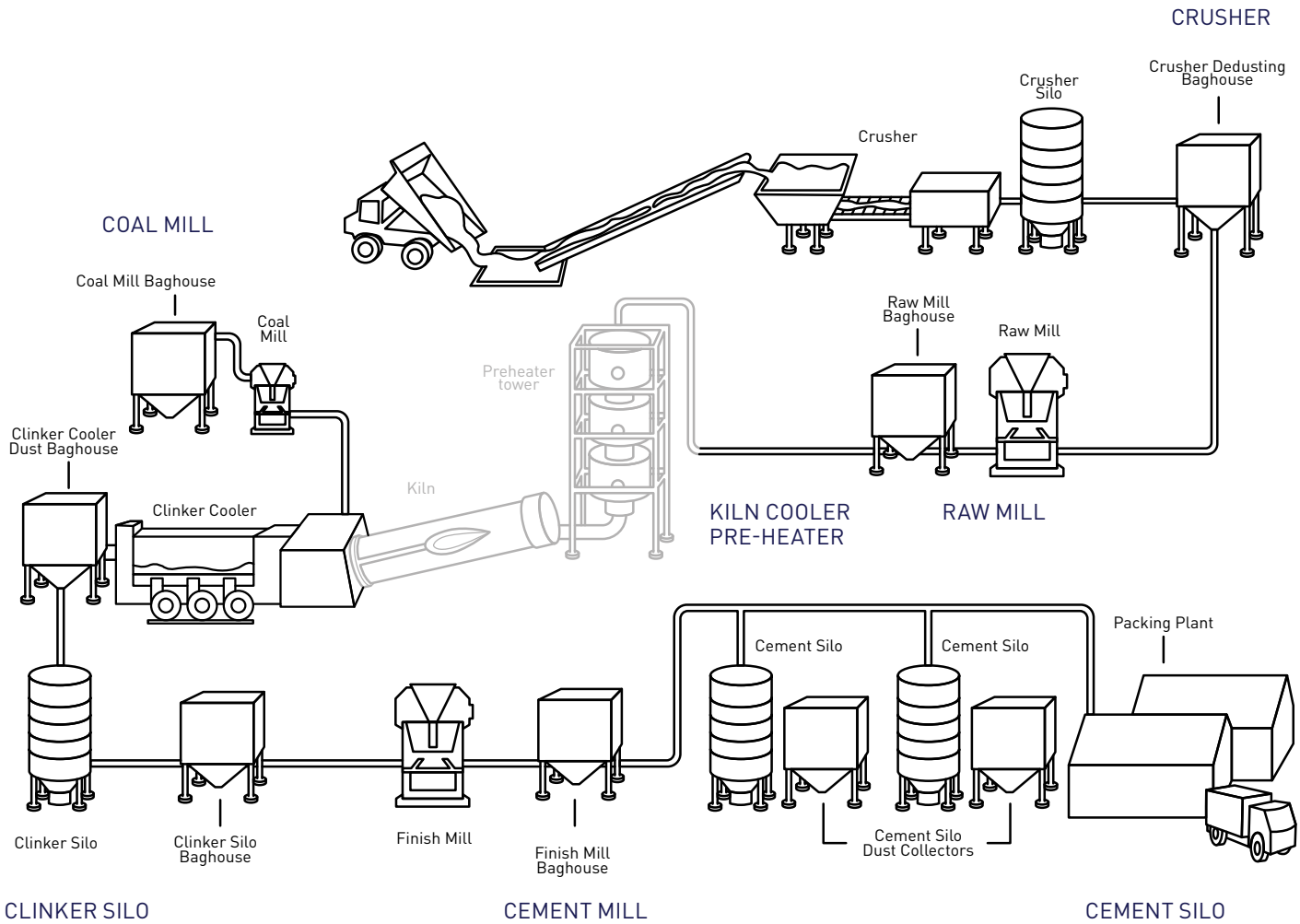
HVAC
For better indoor climate

Inspiration: Case studies

Many baghouses has already obtained "a new life" with the Pleated Bags from Nordic Air Filtration

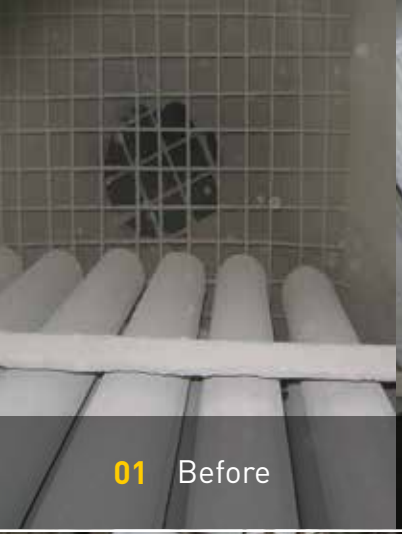
Nordic Air Filtration has great experience with Pleated Bags within the cement and minerals industries. We offer Pleated Bag solutions to almost all parts of the plant where temperature does not exceed 200°C/390°F.

We also offer a wide variety of case studies to prove the feasibility of the Nordic Air Filtration's product range. On the following pages you can find inspiration from eight selected case studies.



	PROBLEM	SOLUTION	RESULT
Undersized dust collector in cement silo **Region:** Africa **Dust type:** Cement 01	The cement silo (cement feeding/packing) was under pressure = high dP Dust was exiting from holes. The safety valve was permanently open Emission a big problem!	Multifit Pleated Bags with PTFE coated polyester media.	Optimizes filtration efficiency Larger filtration area = better running parameters Optimized dust release
Increased output & reduced emission level **Region:** Europe **Dust type:** Cement - Mill 02	High emission levels and poor filter quality from competitor pleated bag Due to undersized dust collector, the cement mill produced only 27 t/h - the customer requested 30 t/h.	Replacing 240 competitor pleated bags with 240 Top Loader Pleated Bags from Nordic Air Filtration with ePTFE membrane media.	10% increased capacity Emission level lowered: Before 22mg/m^3 Now 0.3mg/m^3 Longer life cycle (8 months vs >36 months)
Longer lifetime of filters and prevented abrasions **Region:** Europe **Dust type:** Cement – Clinker transport 03	Holes in bottom of the filter bags caused by harsh airstream. Change out of bags every 3 month.	Replacing the existing filter bags with Pleated Bags with PTFE coated polyester media.	Less abrasions Increasing of the media surface = a more flat dP curve Over 9x the lifetime compared with filter bags

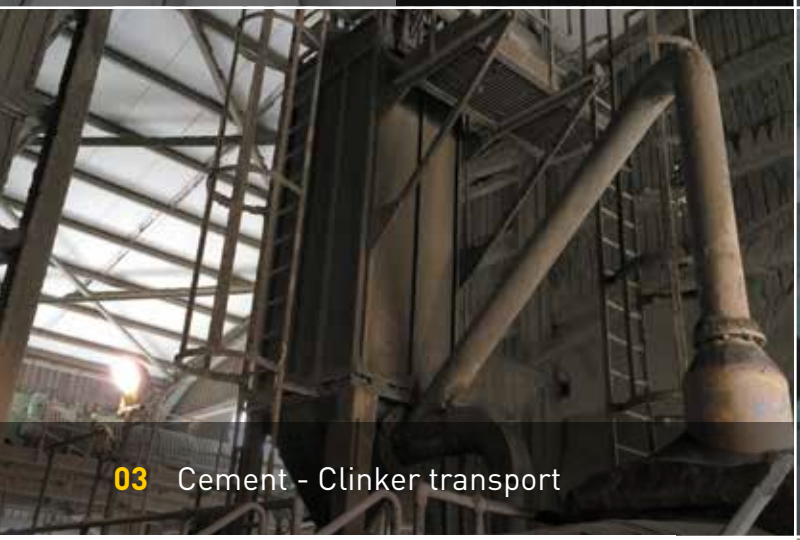
	PROBLEM	SOLUTION	RESULT
High emissions and short lifetime – easy to fix **Region:** Europe – Slovenia **Dust type:** TiO2 / Titanium Dioxide 04	Customer required reduction of emission level and a longer lifetime. Emission level was higher than 20 mg/m^3 Lifetime of filterbags was only 14 months Quality of filter cages was poor, so changeout was also required every 14 months.	Pleated Bags with pleated PPS media and specially developed topflange.	Dropout box increased with 1.5m Lower emission levels (<5mg/m^3) 2.5x longer life time compared with filter bags
High emissions and short life-time – easy to fix **Region:** USA, Texas **Dust type:** Calcium carbonate 05	Abrasion on the bottom of the polyester bags causing leak paths.	Pleated Bags with spun bond polyester media. Shorter, removing filter from abrasion zone.	No holes in bag material = longer life time of filter



01 Before

Solution

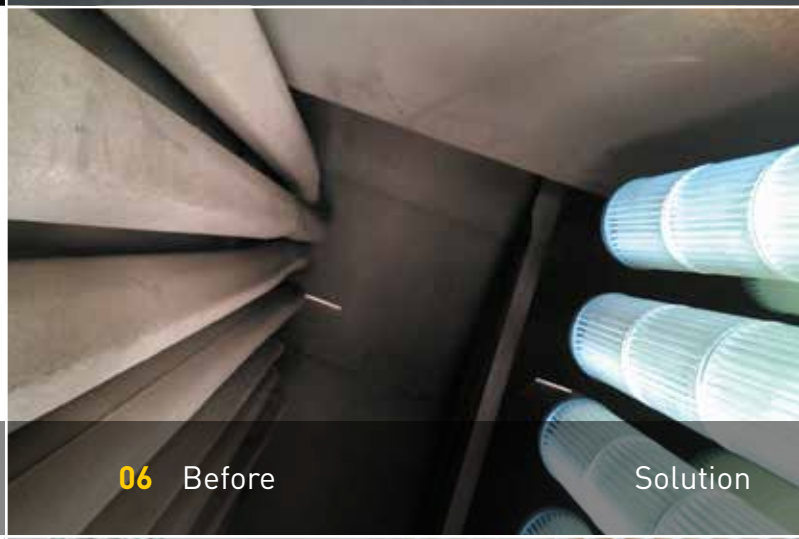
02 Solution



03 Cement - Clinker transport

04 Solution

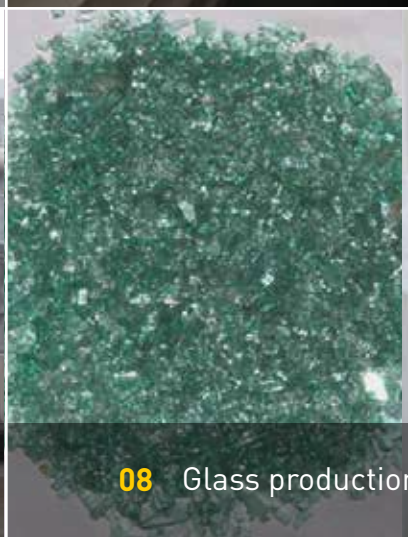
05 Solution



06 Before

Solution

07 Solution



08 Glass production

Solution

High emissions due to several issues was solved by pleated bags

Region: Europe – United Kingdom
Dust type: Slag after casting process and general ventilation of casting fumes / Manganese, foundry ferrous fume and nickel
06

PROBLEM

Bad baffling in two dust collectors caused swinging of the 4 meter long filter bags. This resulted in holes in bags and thereby high emissions (higher than the 20mg/m3 set out by public authorities).

SOLUTION

CPB type pleated bag with PTFE coated polyester media

RESULT

- Decreasing of filter length (1.26m vs. 4m) has removed issue with swinging bags
- The PU-top makes holeplate fit easy
- Lower dP with spunbond polyester = lower cleanings costs
- Filter surface area increased by 10%
- Weltech technology = equal pleat distance

Increased output & reduced emission level

Region: Europe – Slovenia
Dust type: Production of steel mesh for construction / Dedusting of all processes, incl. welding fumes & iron oxide
07

When designing a new dustcollector, the enduser wanted long life time of filters, a small and compact dust collector and low emission values.

By installing 228 Pleated Bags from Nordic Air Filtration the following advantages were obtained.

- Low Air-To-Cloth compared to a filter bag solution with same length
- Optimal dust release with PTFE coated spunbond polyester media
- Low emission values:
  Required 10 mg/m^3
  Actual 0.3 mg/m^3

Bands fell of and short life cycle

Region: Asia - China
Dust type: Gas & dust from glass production
08

PROBLEM

The customer wanted to Prolong the life cycle of their filters (Previous pleated bag filters lasted max. 8 months)
Avoid problems with the straps falling off and pleat joint that loosened when operating at temperatures above 85°C/185°F and with chemical dust

SOLUTION

Nordic Air Filtration's Multifit Pleated Bag with PTFE coated filter media and glue free Weltech straps was chosen.

RESULT

- The bands isn't falling off due to the ultrasonic welded bands
- Optimized dust release due to PTFE coated media
- 5x life time compared with previous pleated bag solution

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. Here 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 | 5-6 BAR / 90 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

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

Reservoir
01

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.

Cleaning Air
02

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

Pulse Frequency
03

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

Pulse Sequence
04

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.

Hopper
05

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.

Emission/bleed through
06

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. To reduce emission/bleed through, advantages can be achieved by upgrading from conventional filter bags to pleated bags with spunbond media or media with an ePTFE membrane.

Choice of media
07

All dust types have specific characteristics and requires different handling. 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.

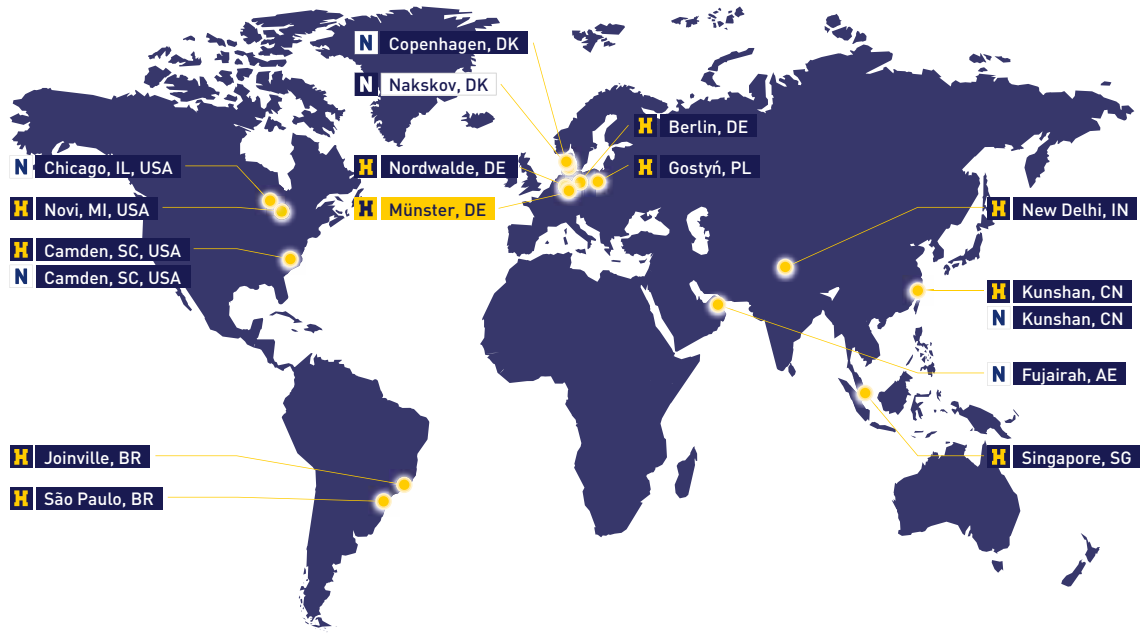
Air flow
08

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. If you need to handle more m^3/hour, more filter area is usually required.

Drop out box
09

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.

Your global provider of air filtration solutions



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