Choice of the Optimal Filter Medium

Textile filter media have consistently gained in importance regarding industrial dust separation. Reasons are stricter legislation, the demand for lower emission rates, and last but not least the moral and social obligation to protect the environment.

Based on the know-how of decades, BWF Envirotec develop, produce and sell filter media for industrial dust removal, separation of solids from liquids and product recovery.

The production programme comprised a wide range of filter material designs and ready-made filter media made of all types of synthetic fibres and scrims currently available on the market.

The experience of our engineering service, combined with the expertise of our R& D department, is the basis for selecting the best possible filter medium for the end user. At BWF Envirotec, our primary objective is to offer solutions from an economical and process engineering point of view.

The Choice Criteria:

1. **Gas stream properties and temperature**
2. **Dust characteristic, concentration and composition**
3. **Dust separation method**

All other criteria for the choice of the optimal filter medium must meet or exceed minimum emission control standards and lifetime.

Choice Criteria:
Gas and Temperature

The chemical and physical properties of the fibres have an essential influence on the efficiency and the stability of the filter medium. Chemical, thermal and physical effects can impact the different kinds of fibres in various manners.
Knowing the fibre characteristics, we are able to provide optimal solutions with regard to efficiency and process conditions. The table below will be of assistance for fibre selection.
If the temperature drops below this limit, the water will condense and form droplets on the filter medium. Besides this, with existing corrosive gases, the development of aggressive acids is possible.
Moreover, cleaning effectiveness will be reduced by the formation of a wet, sticky dust layer. As a direct consequence pressure drop problems may occur, if acids form, chemical degradiation of the filter medium, supporting cage and dust collector will take place.
For your information:
When operating a filter plant, the temperature must always be above the dew point.

Resistance of synthetic fibres to the influence of chemicals and to temperatures

Scrim and Fibre Types:	**Continuous operating temp. (Maximum)**	**BWF description**	**Resistance to Hydrolysis**	**Resistance to Acids**	**Resistance to Alkalis**	**Resistance to Oxidation**
Polypropylene	90°C / (95°C)	PP	1	1	1	4
Polyamide	110°C / (115°C)	PA	4	3	2	3
Polyacrylonitrile copolymer	115°C / (120°C)	AC	2	3	3	2
Temperature resistant Olefin	125°C / (135°C)	RO	1	1	1	4
Polyacylonitrile homopolymer	125°C / (140°C)	DT	2	2	3	2
Polyester	150°C / (150°C)	PE	4	3	4	2
Polyphenylensulfide	190°C / (200°C)	PPS	1	1	1	3
m-Aramide	200°C / (220°C)	NO, NX	3	3	3	3
Aromatic polyamide-imide	200°C / (220°C)	KMT	4	3	4	3
Polymide	240°C / (260°C)	PI	2	3	3	2
Polytetrafluorethylene	250°C / (280°C)	PTFE, TF, TFL	1	1	1	1

1) excellent; 2) good; 3) moderate; 4) restricted

Choice Criteria:
Dust

Besides the necessary knowledge about the dust source and the process conditions, the following criteria are of decisive importance:

1. Dust Concentration
- dust proportion in raw gas
2. Dust Composition
- particle size
- chemical composition of the dust
3. Dust Characteristics
- electrostatic properties
- tendency to agglomerate
- hygroscopic properties
- setting rate
- abrasiveness
- bulk density

Treatment:	**Code 1**	**Code 4 Glaze**	**x-surf Si Code 9**	**CS 17®**	**CS 18®**	**CS 29**	**CS30 CS 31**	**CS 42 at NO, NX**	**Fireguard®**	**PyroGuard®**	**MPS®**	**Epi, as ExCharge®**
Properties of the dust												
Free flowing	•											
Agglomerating		•										
Extremely fine											•	
Abrasive	•		•									
Humid				•		•		•				
Sticky		•		•	•		•					
Electrostatic chargeability												•
Occasional spark flow									•			
Acid/alkaline						•		•				
Pyrophoric dust										•		

Code 1:	signed face side
Code 4 Glaze :	glazed face side
x-surf, Si, Code 9:	full bath oil and water finish
CS 17®:	full bath oil and water repellent finish
CS 18®:	PTFE surface coating
CS 29:	protective treatment against moderate chemical attack
CS 30:	full bath PTFE treatment
CS 31:	full bath PTFE oil and water repellent finish
CS 42:	protective treatment against chemical and hydrolytic attack
FireGuard®:	spark resistant top layer
PyroGuard®:	a layer of graphite to protect the felt from pyrophoric dust
MPS®:	Micro Pore Size, high efficiency design filter medium
Epi:	epitropic fibre blend
as:	stainless steel fibre blend
ExCharge®:	permanent conductive matrix

Choice Criteria:
Dust Separation Procedure

Different dust separation procedures for filter media require different weights and air permeability values.

The Rules:
The more effective the cleaning process, the more compact and heavier the filter medium can be.

Dust Separation Procedure	**Weight (g/m^2)**	**Air Permeability**	
		mm/s@200Pa*	**$I/(dm^2 min)$@200Pa**
Intermittent shaking	300-350	667-1.000	400-600
Shaking-and Reverse Air	350-450	417-667	250-400
Low pressure cleaning	400-500	250-583	150-350
Jet-Pulse	500-650	83-250	50-150

*acc. To EN ISO 9237