

Pre and Fine filtration



Camfil College, 2013

New European test standard EN779:2012

Table 1— Classification of air filters¹⁾

Group	Class	Final test pressure drop Pa	Average arrestance (A_m) of synthetic dust %	Average efficiency (E_m) of 0,4 μ m particles %	Minimum Efficiency ²⁾ of 0,4 μ m particles %
Coarse	G1	250	$50 \leq A_m < 65$	-	-
	G2	250	$65 \leq A_m < 80$	-	-
	G3	250	$80 \leq A_m < 90$	-	-
	G4	250	$90 \leq A_m$	-	-
Medium	M5	450	-	$40 \leq E_m < 60$	-
	M6	450	-	$60 \leq E_m < 80$	-
Fine	F7	450	-	$80 \leq E_m < 90$	35
	F8	450	-	$90 \leq E_m < 95$	55
	F9	450	-	$95 \leq E_m$	70

template



Most common product families:

Prefilters (G1-G4)

- Compact (30/30, Aeropleat, AP Eleven 30/30 WR)
- Bag filters (Hi-Cap)

Fine Filters (M5-F9)

- Compact (Opakfil/Durafil, Ecopleat)
- Bag filters (Hi-Flo and S-Flo)

Particle/Carbon Combination Filters

- Pleated (City-pleat)
- Compact (City-Carb, City-Sorb)
- Bag filters (City-Flo)

Pre-filters (coarse filters)

Aeropleat III and 30/30

Filter type: Panel, Prefilter, G4

Media: Synthetic + Cotton, pleated media

Frame: Beverage cardboard

Benefits: Strong, Water resistant frame

Low dP- unique radial pleat design

Low dP- big surface

Supported, welded wire-backed media



Pleated Panel Filters
30/30®



Pleated Panel Filters
AeroPleat® III

Pre-filters (coarse filters)



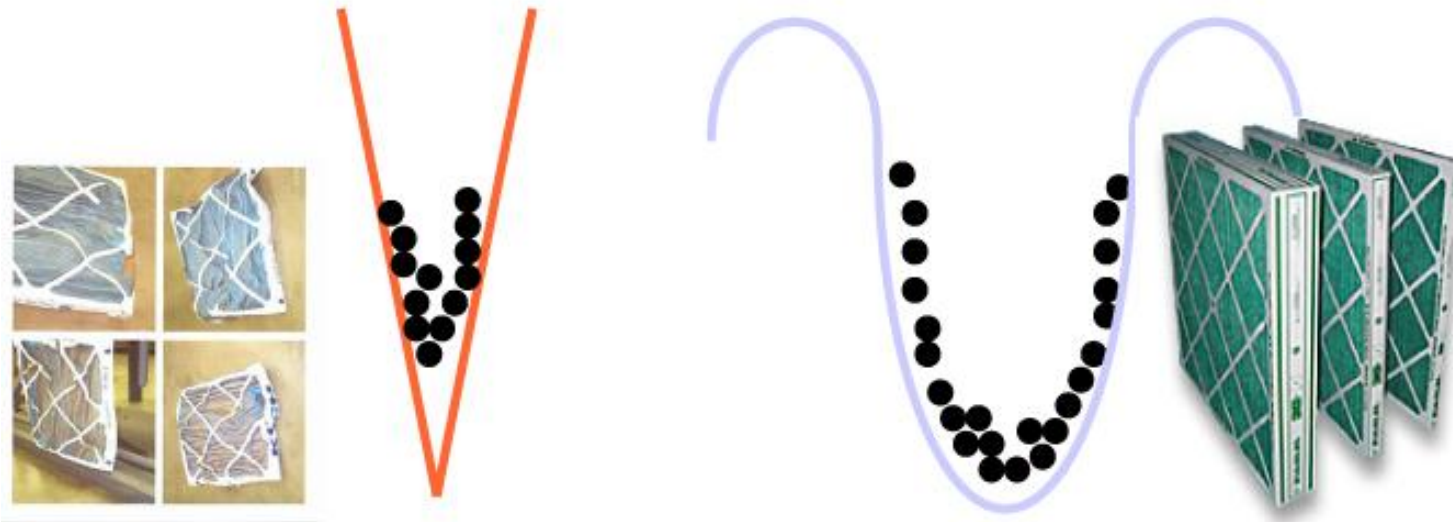
Pleated Panel Filters
30/30*



Pleated Panel Filters
AeroPleat® III

Chandler or 'V' type pleat will blind causing rapid increase in pressure drop.

Uniform radial style pleat loads evenly resulting, in lower average pressure drop and long loading curve.



Pre-filters (coarse filters)

Aeropleat Eleven

Filter type: Panel, Prefilter, MERV 11 (M5)

Media: Uniform lofted synthetic pleated media.

Frame: Beverage cardboard.

Benefits: Strong, Water resistant frame

Low dP- unique radial pleat design

Low dP- big surface

Supported, welded wire-backed media



Pleated Panel Filters

AP Eleven

Pre-filters (coarse filters)

30/30 WR

Filter type: Panel, Prefilter, G4

Media: Multi-layered non-cellulose pleated media.

Frame: Water resistant special cardboard

Benefits: 2-1 performance. Water & dirt.

Very strong, Water resistant frame and media

Large media surface.

Suitable coastal or offshore installations.

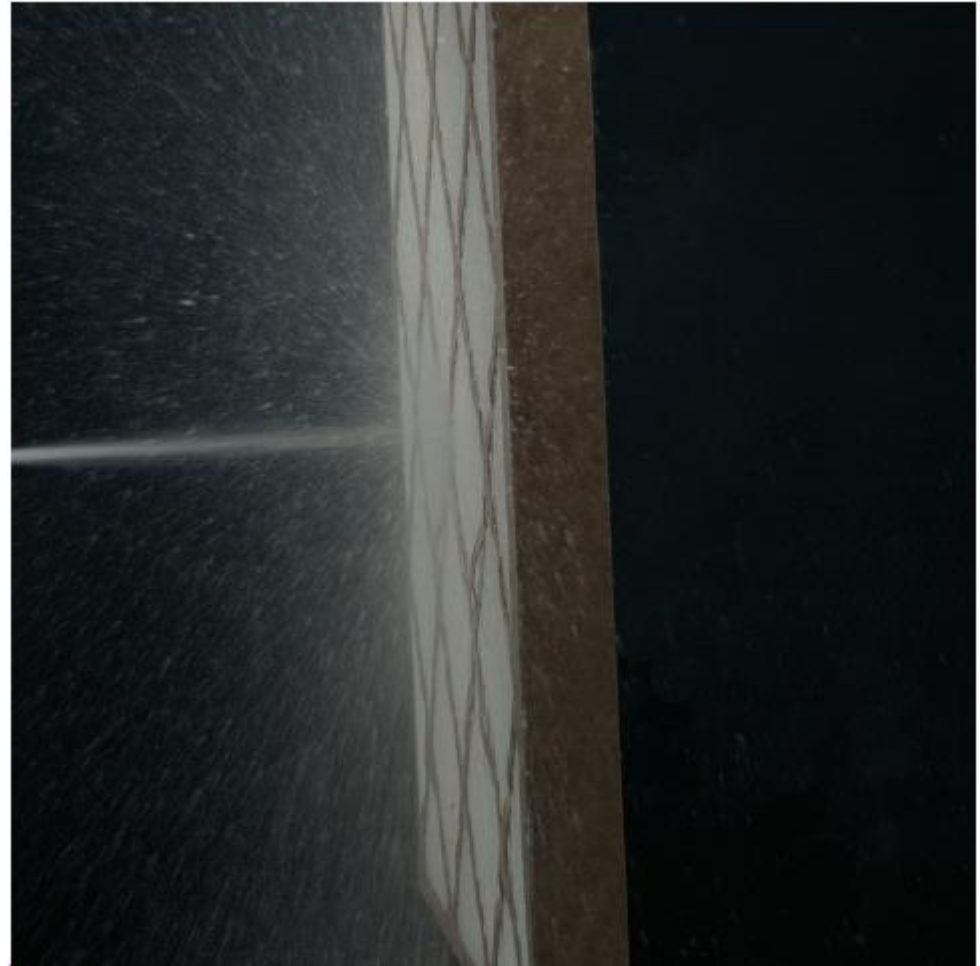


Pre-filters (coarse filters)



When subjected to water testing at a feed rate equivalent to 11 inches per hour of rain.

– the R30/30 WR test filters allowed no water penetration to the downstream side.



Pre-filters (coarse filters)

Hi-Cap and Hi-Cap G

Filter type	Prefilter, G4
Media	Synthetic media, welded pockets
Frame	Metal, plastic
Benefits	Lifetime (big surface, lofty media) Low dP- low energy (big surface) High Arrestance Rigid and strong construction



Hi Cap G



Medium and Fine filters

Hi-Flo

Filter Type: Fine Filter, bag filter type (M5-F9)

Media: Fibre Glass

Frame: Metal

Benefits:

- Guaranteed stable efficiency – EN779:2012
- Low dP -from optimised media => low running cost
- controlled media spacing => low running cost
- Long Lifetime; from low dP + optimised media
- Complete range of bag filters.



Medium and Fine filters

S-Flo and S-Flo G

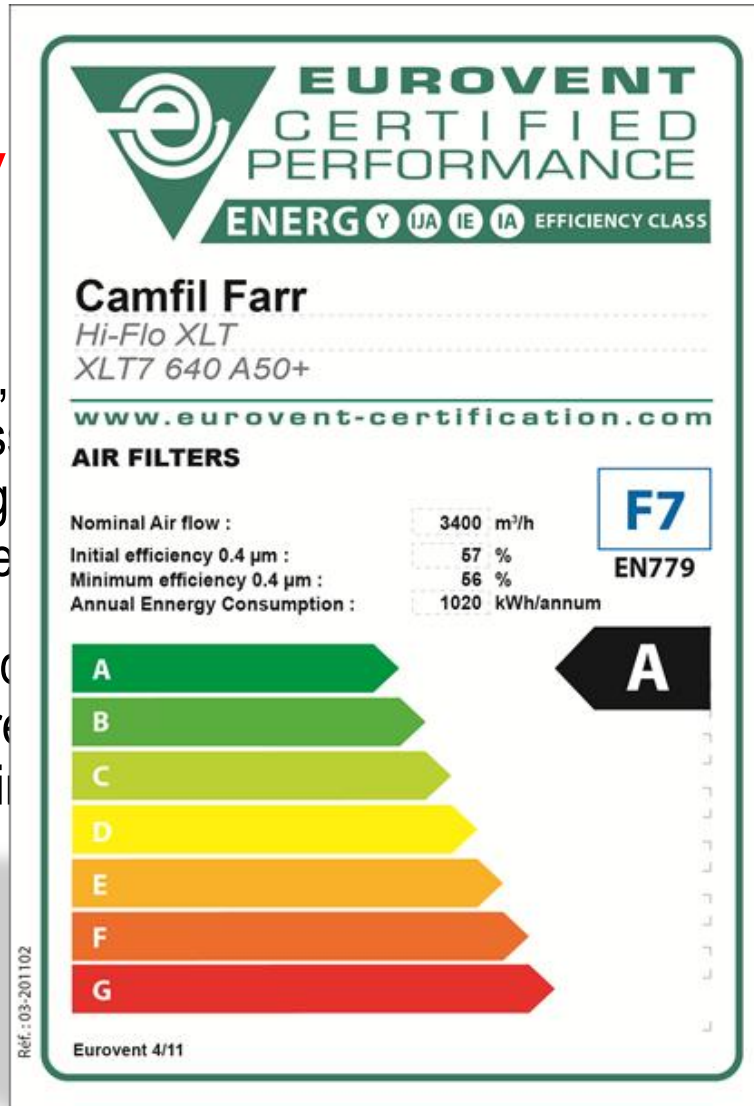
Filter Type:	Fine filter, bagfilter type (M5-F8)
Media :	Synthetic, stitched or welded pockets
Frame:	Metal, (plastic on request)
Benefits:	Economy version for low price strategy. Low dP (Controlled media spacing)



Medium and Fine filters

Hi-Flo XL **NEW**

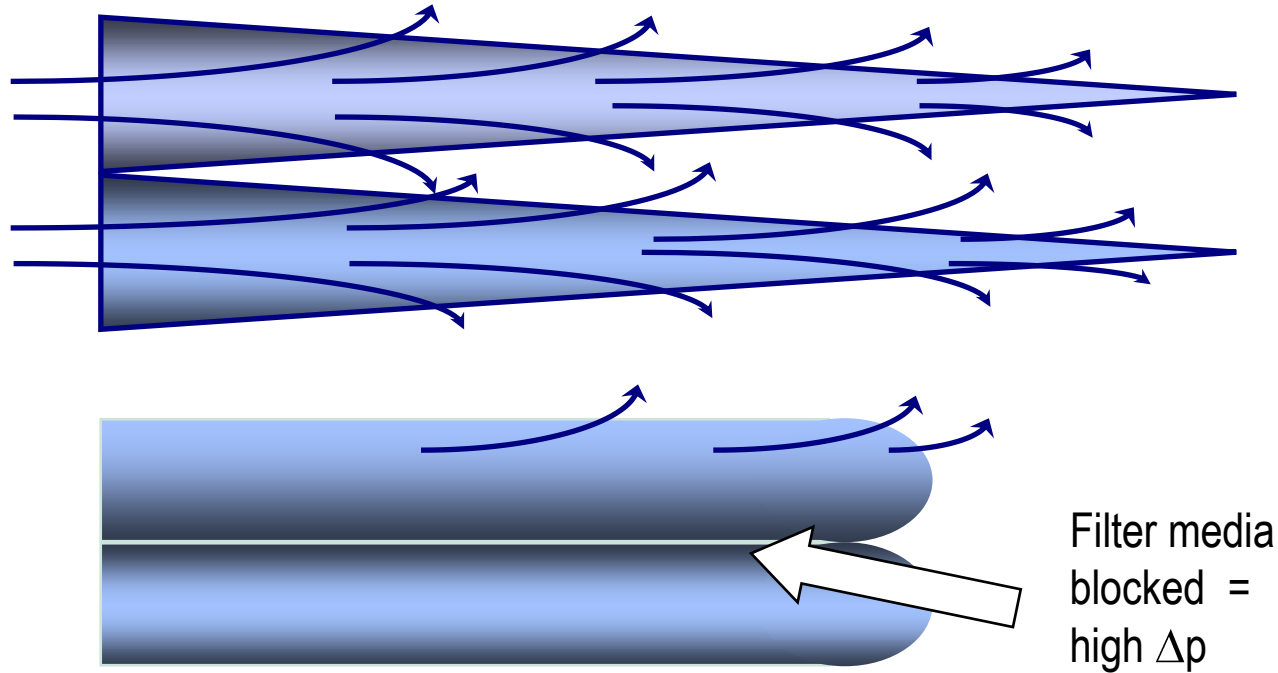
Filter Type: Fine Filter,
Media: Fibre Glas
Frame: Plastic, rig
Benefits: Guarantee
- Very low
- controlled
- Flat incre
- Fully inci



79:2012
cost



Medium and Fine filters

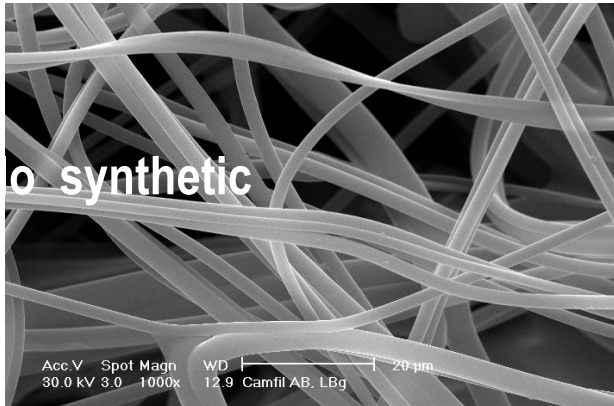


The Filter Media

Hi-Flo F7 glass fiber



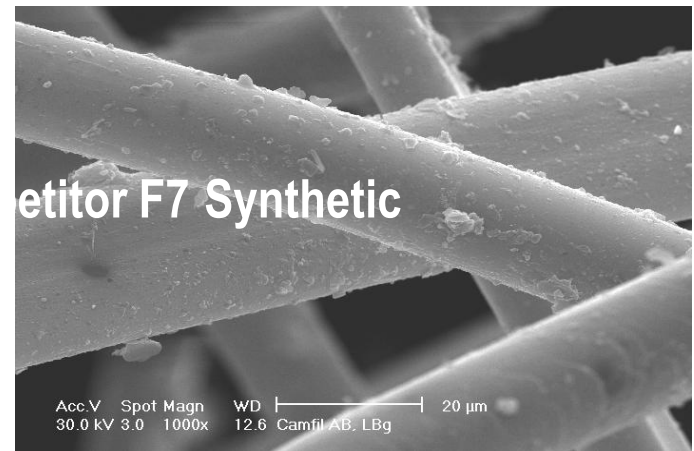
S-Flo synthetic



Typical Particle



Competitor F7 Synthetic



The Filter Media

⇒ Glass fibres

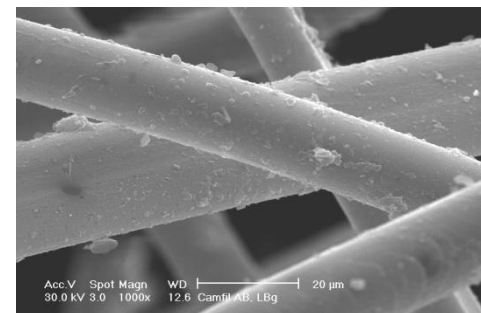
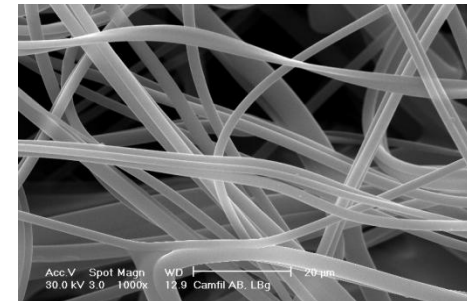
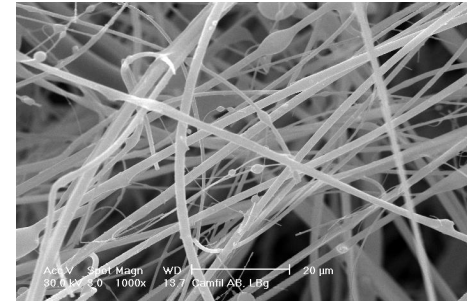
normally fine fibre diameter => high efficiency
hard material => "lofty" => low Pressure drop

⇒ Synthetic fibres (plastic)

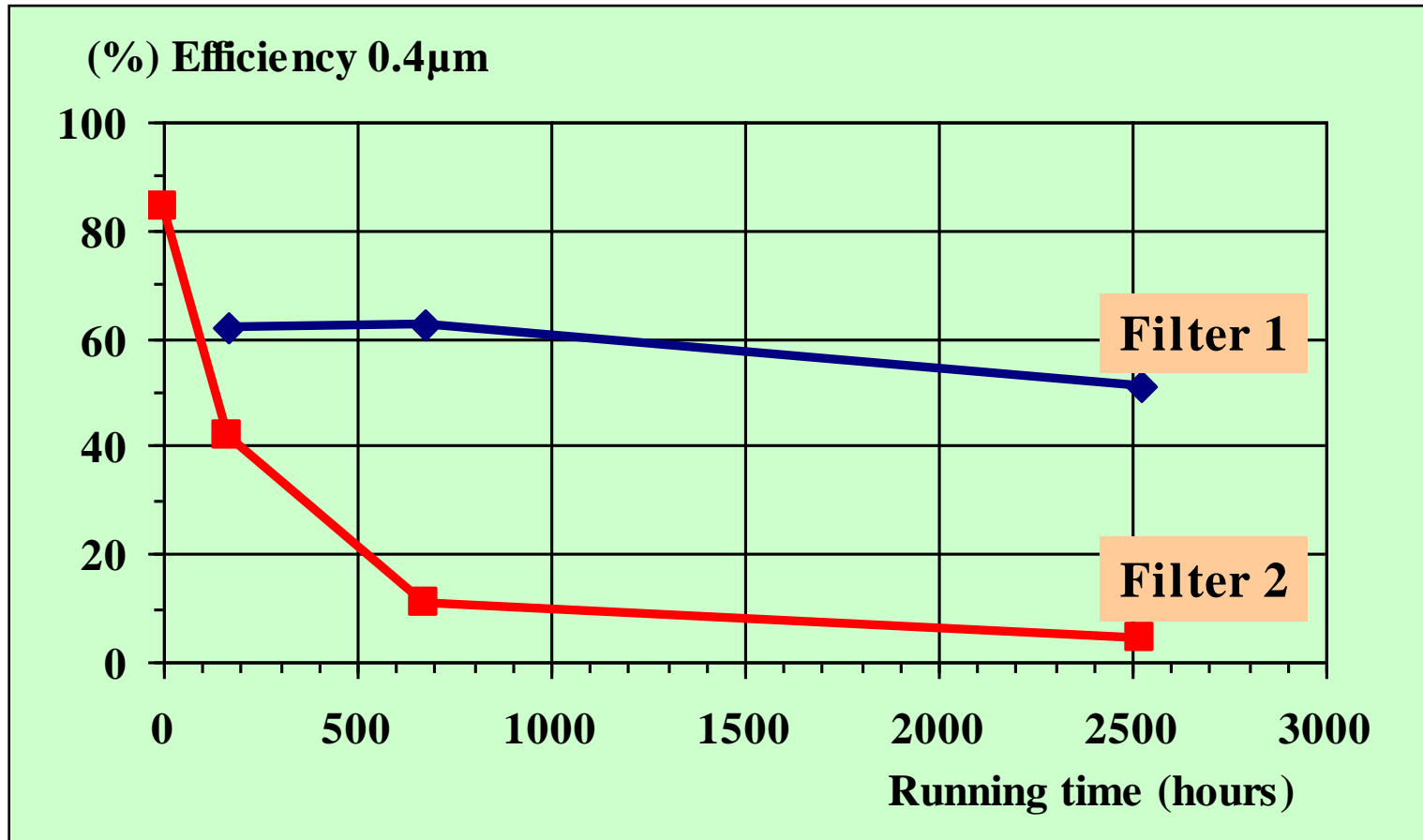
normally coarse fibres => low efficiency
electrostatic charge => decreasing efficiency

⇒ Electrostatic charge

- Appears by passing the media through an electrical field and by the manufacturing process itself.
- Disappears in use; how fast depends on: amount of air, type of air, type of material in the fibre, type of charging process



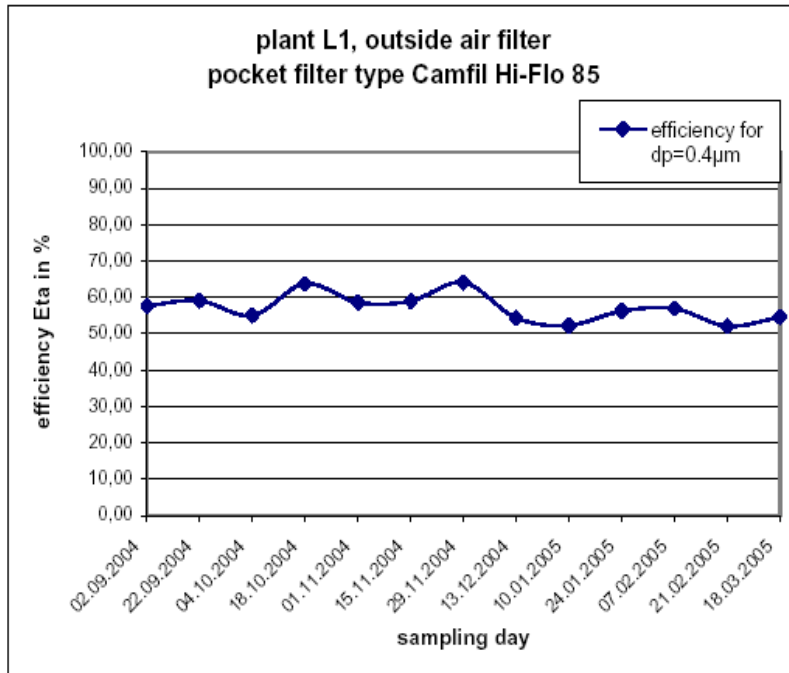
The Filter Media



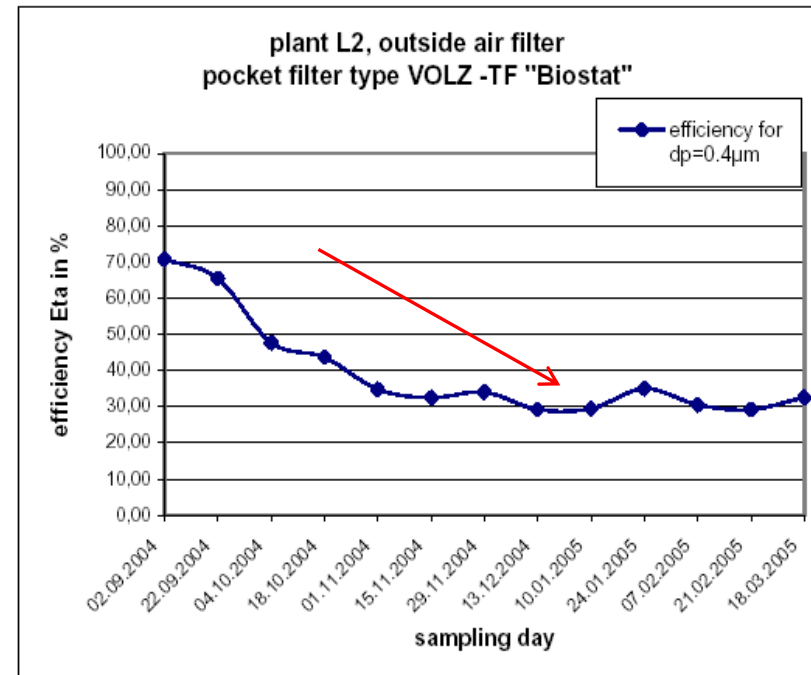
The Filter Media

Outside Air Filter Measurement Results (1st filter stages), Second Measurement Period

In accordance with DIN EN 779, only measurement results for particle size of $0.4 \mu\text{m}$ are used.



Outside Air Filter, Plant L1
Glass Fibre Pocket Filter Camfil - F7
Type 3 P 85

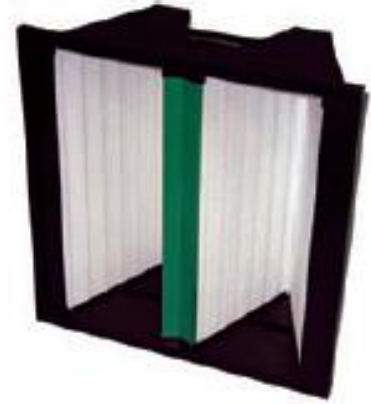


Outside Air Filter, Plant L2
Synthetic Fibre Pocket Filter - F7
VOLZ "Biostat"

Medium and Fine filters

Opakfil 2V

Filter Type	Fine filters, compact (M6-F8)
Media	Fibre Glass, pleated media
Framing	Plastic
Benefits	Guaranteed stable efficiency Low cost alternative. Rigid and light weight Fully incinerable design.
	Perfect upgrade vs Alu Separators



Compact Filter
Opakfil 2V



Medium and Fine filters

Opakfil Green

Filter Type	Fine filters, compact (M6-F9)
Media	Fibre Glass, pleated media
Framing	Plastic
Benefits	Guaranteed stable efficiency Low dP at high Air Flow Large filter area - long lifetime, even with a compact installation Rigid, but light weight Fully incinerable design.



Compact Filter
Opakfil Green

Medium and Fine filters

Durafil ES

Filter Type

Fine filters, compact (M6-F9)

Media

Fibre Glass, pleated media

Framing

Plastic

Benefits

Guaranteed stable efficiency

Lowest LCC.

Large filter area - long lifetime, even with a compact installation

Rigid, but light weight

Perfect for close coupled installations

- Also available in box type



Medium and Fine filters

Ecopleat

Filter Type	Fine filter, compact (M6-F8)
Media	Fibre Glass, pleated media
Frame	Plastic or metal
Benefits	Very Compact Large media area Flexible in size Guaranteed stable efficiency (fine fibres)



Medium and Fine filters

Others.....



Particle/Carbon Combination Filters

Our 2-in-1 principle

Our CityPleat, City-Flo and CityCarb filter are able to remove particles, bacteria, spores, air pollution and smell. As a result the indoor air quality (IAQ) index is significantly improved.

Applications

For urban environments

Schools, shopping centres

Offices and other buildings close

to streets and roads with intense traffic

Reduce VOC (volatile organic compounds) and odours

Highly efficient at ozone



Particle/Carbon Combination Filters

City-Pleat

Filter Type	Compact Combination (G4+ carbon)
Media	Meltblown+ carbon, pleated media
Framing	Beverage Cardboard
Benefits	2 in 1 solution for best IAQ Compact installation RAD for effective gas collection High quality carbon Light weight, easy handling and installation



Particle/Carbon Combination Filters

City-Carb

Filter Type	Compact Combination (F7+ carbon)
Media	Meltblown + carbon, pleated media
Framing	Plastic
Benefits	2 in 1 solution for best IAQ Low dP (big surface) Compact installation Stable efficiency (fine fibres) RAD for effective gas collection High quality carbon => enough weight Light weight, easy handling and installation



Particle/Carbon Combination Filters

City-Flo

Filter Type	Bag filter Combination (F7+ carbon)
Media	Fibreglass + carbon, stitched pockets
Frame	Metal
Benefits	Low ΔP Stable efficiency (fine fibres) Light weight, easy handling and installation High quality carbon => enough weight Incinerable frame and media

