AFP-AZ Process Removal of Trace Air Constituents in Process Applications

CLEAN AIR

POWER GENERATION

CLEAN ROOM

INDUSTRIAL

AFP-AZ Process adsorption filters are applied where even small concentrations of gases in the air have an impact on the quality of products.

These processes can be used in the electronic industry, such as micro-electronics and semi-conductor production, as well as in the manufacture of optics, MEMS (micro-electrical-mechanical systems) or high-precision mechanical devices.

Moreover, AFP-AZ Process filters are to protect precious objects and artefacts in museums and libraries from the deteriorating effects of trace gases in the air.

AFP-AZ Process filters contain a composite filter material including fine granules of specially designed activated carbon. The activated carbon is a non-impregnated version for maximum performance on a broad variety of Volatile Organic Compounds (VOC) as well as Condensable Organic Compounds (COC); condensables as per ISO/FDIS 1464 4-8:2005).

AFP-AZ Process filters are available in 4 standard sizes.

KEY FACTS

- Standard air flow 2,500 m^3/h: Suitable for even the most demanding of applications
- Low pressure drop. Reduces energy consumption and lowers operating costs
- Optimised flow design: For low, stable pressure drop and homogenous air flow
- Composite media: No particle generation
- Lightweight: For simple filter change
- Activated carbon media: Designed specifically for process air applications
- Large filter surface 10 m^2: For high efficiency and long service life
- Both incinerable or non-flammable frame systems available: For simple disposal and demanding applications
- Fits standard air handling units: For simple, low cost installation and switchover

AFP-AZ Process Design and Application

DESIGN

AFP filters are designed as rigid cellular 4-V filters with mini-pleated media in a header frame, to fulfil the demands of industrial applications.

Using a mini-pleated composite media, there is no risk of settlement of sorbent material and leakage as in systems using sorbents in bulk form. The design of the composite filter material, the production parameters and the optimised flow design of the rigid cell, provide the best possible conditions for low and stable pressure drop in operation, as well as homogeneous filter flow. Generally poluyrethane is being used to cast the activated carbon pleat packs to the frame. With the implementation of self-sealing pleat packs this is not necessary anymore with the advantage that undesired outgassing of the polyurethane can be avoided.[1)]

The design of the composite material is comparable to a fixed bed of microgranular sorbent particles. Fixation of the granules prevents movement and settlement of sorbent in the air stream. Hence the dense packing guarantees of high filtration efficiencies for trace gas components and ideal pleat shape. No particles or dust are generated by AFP filter material as can be proven by particle measurements downstream of the filter during operation.

AREAS OF APPLICATION

AFP-AZ Process filters are particularly effective in the removal of:

- Hospital and antiseptic odours
- Volatile organic compounds (VOC) or hydrocarbons from air streams in recirculated air or fresh air for production under clean room conditions
- Condensables (COC) as per ISO/FDIS 14644-8: 2005 from air streams in recirculated air or fresh air for production under clean room conditions
- Dopants as organo-phosphorous compounds or organo-boron compounds from air streams in production processes
- Ozone from outside air supplies or air recirculation
- Odourous combustion products, kerosene and diesel
- Many other gaseous contaminants
- Organic solvent trace gases from recirculated air of production environments, such as PGMEA, PGME, acetic acid esters

Occurrence of the target compounds to be removed and applications for AFP-AZ Process filters:

- Micro-electronic industry and display manufacturing
- Optical industry and laser application
- Imaging and photography processes
- Museums and archives
- Airports, office buildings and hospitals

1) Operational pressure should not exceed 500 Pa.

AFP-AZ Process Installation and Disposal

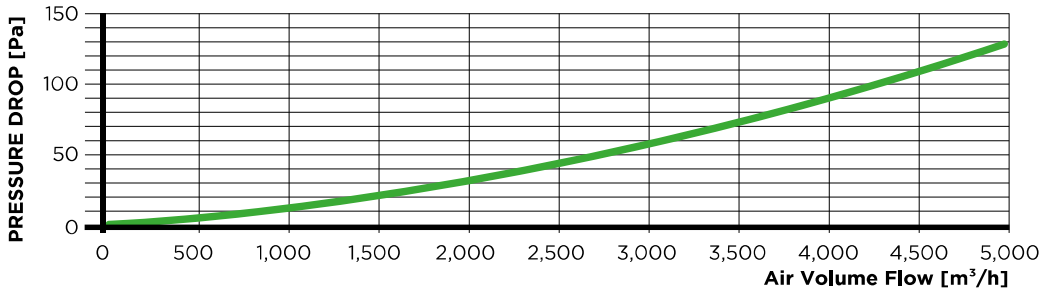
INSTALLATION

AFP Process filters can be easily installed in standard fine dust filter frames. F-frames can be combined with filter barriers and installed into ducts, air conditioning units and wall openings. Install the filter in a vertical position (Vertical V`s)

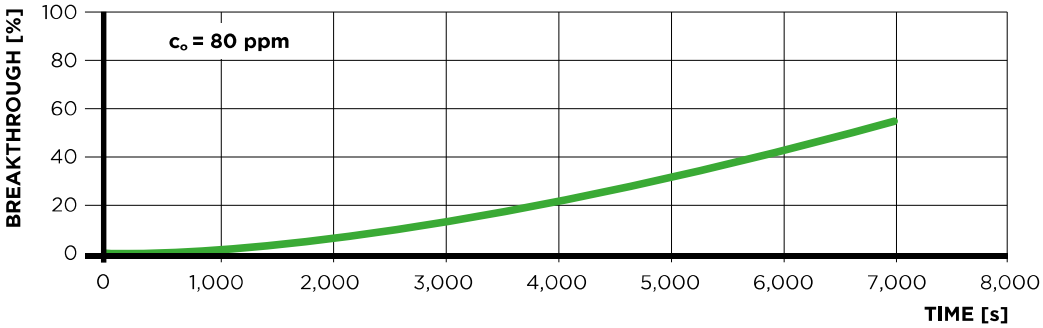
DISPOSAL

AFP Process filters used under standard operation conditions to remove trace contaminations from process air environments can be disposed in the same way as normal industrial waste (e.g. incineration, landfill). Filters soiled by toxic and/or radioactive constituents must be disposed as hazardous waste in accordance with local regulations.

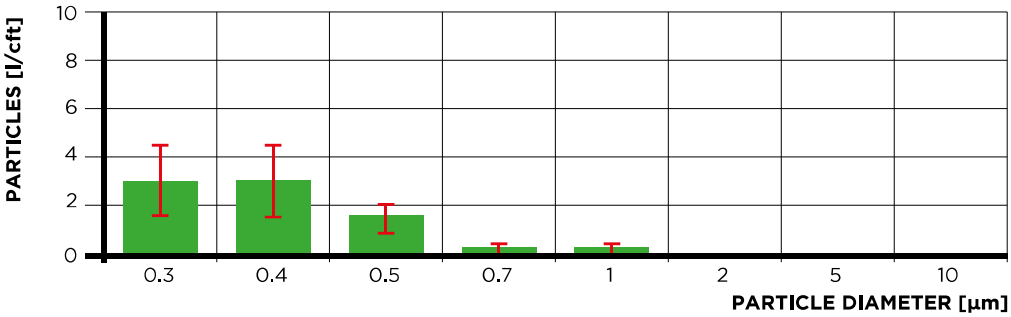
PRESSURE DROP VERSUS AIR FLOW (FOR AZ-610)



TOLUENE ABSORPTION (FOR AZ-610)



SHEDDING TEST



AFP-AZ Process
Technical Data

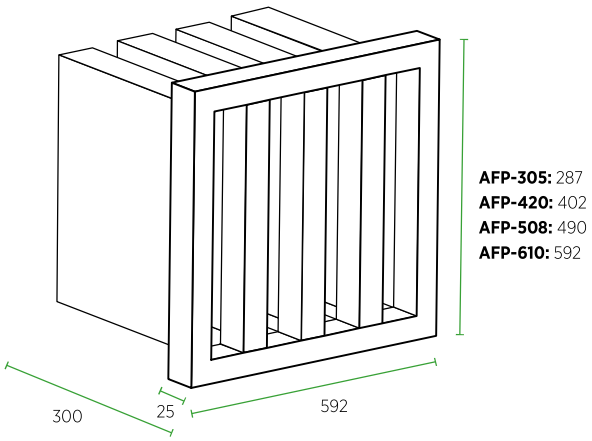
Technical Data	AFP-	AZ-610-P	AZ-508-P	AZ-420-P	AZ-305-P
Nominal Air Flow V_n (normal service life)	m^3/h	2500	2000	1650	1250
Pressure Drop at V_n	Pa	45	45	50	50
Rated Air Flow V_r (long service life)	m^3/h	1800	1450	1200	900
Pressure Drop at V_r	Pa	25	25	30	30
Total Weight of Filter	kg	8.8	7.6	6.6	5.2
Sorbent Net Weight	kg	5.1	4.2	3.3	2.3
Filter Medium Area	m2	6.4	5.3	4.1	7.9
Initial Efficiency at Rated Air Flow	%	98	98	98	98
Adsorption Capacity at Rated Air Flow V_r [1)]	g	700	550	450	300

Operation Conditions	
Maximum Operating Temperature	< 50 °C
Recommended Operating Temperature	< 30°C
Maximum Relative Humidity	< 90 %
Recommended Relative Humidity	< 30 % < x < 60 %
Minimum Pre-Filtration	M6
Recommended Pre-Filtration	F9
Back-Up Filtration Required	None – no particle shedding

Materials	
Frame Material	Polystyrene, free from halogenated compounds, incinerable
Filter Material (HT-version)	Polyamide, galvanized steel, non-flammable, UL 94 V0 frame version
Filter Material	Synthetic fibre composite material, fine grain sorbents embedded in fibre matrix

1) for toluene c_0=80ppm, acc. to ISO 11155-2, capacity until 50% efficiency

DIMENSIONS (mm)



AFP-305: 287
AFP-420: 402
AFP-508: 490
AFP-610: 592