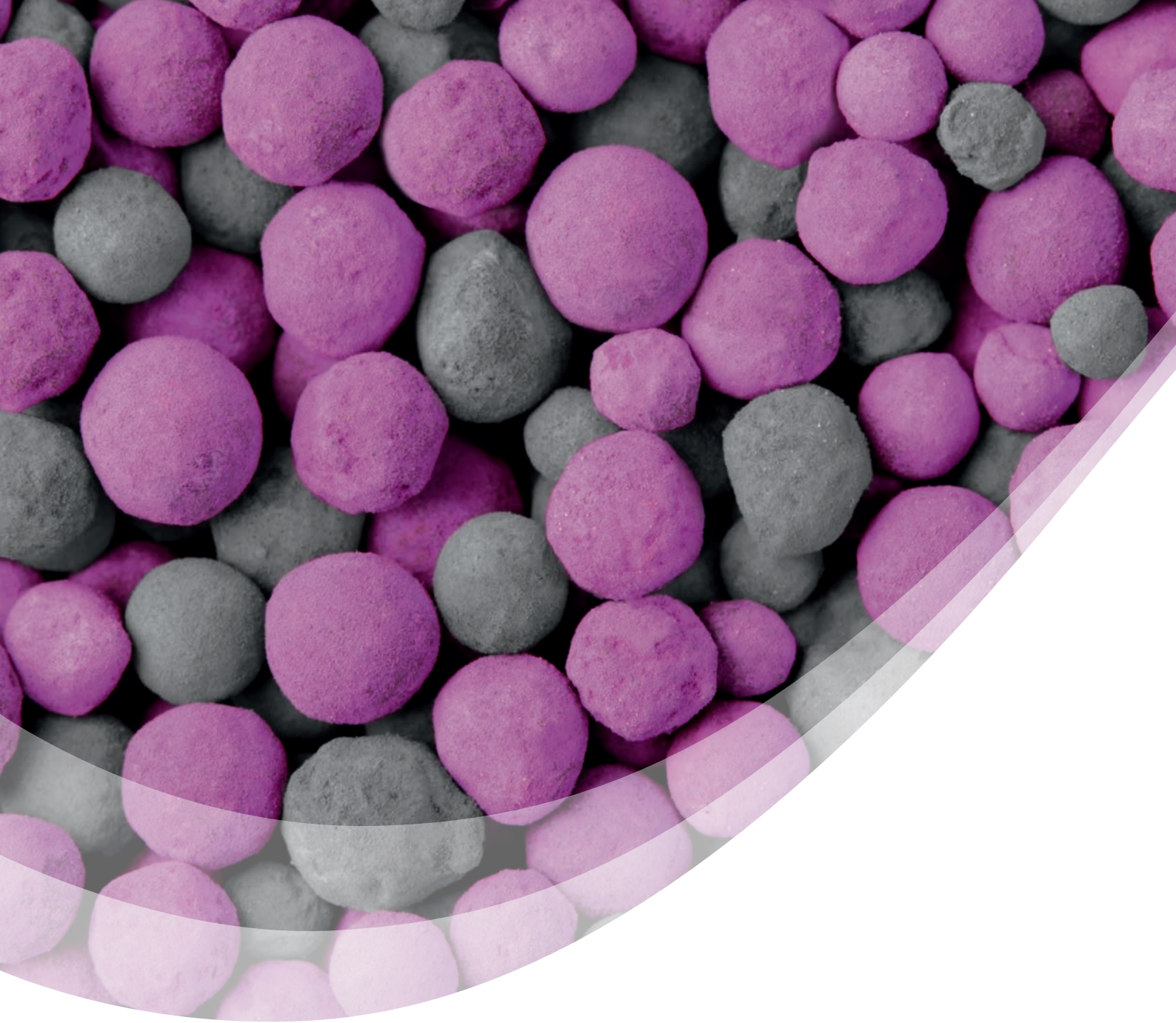


viledon®

CORROSION CONTROL FOR KEY COMPONENTS

COMPLETE GAS PHASE FILTRATION SOLUTIONS

FREUDENBERG
FILTRATION TECHNOLOGIES

FREUDENBERG
INNOVATING TOGETHER

A CRITICAL CHALLENGE DESERVES A SOPHISTICATED SOLUTION

CORROSION CONTROL FROM A RELIABLE FILTRATION SPECIALIST

Corrosion is caused by many contaminants, from acidic gases to ozone and moisture in the air around us. Whatever its cause, the results of corrosion are impossible to ignore. Less effective processes, additional maintenance, costly repairs and unplanned downtime.

Filtration expertise you can trust

Freudenberg Filtration Technologies is a technology leader in industrial air, gas and liquid filtration. Our know-how in gas phase filtration, combined with our specialist knowledge of particle filtration, enables us to offer you a fully designed solution: from system specification to product manufacture, installation and ongoing service support.

Holistic solutions

Our gas phase filtration solutions are designed to protect all sensitive areas of your processes, from electronic control units, motor controls , data centers and switchgear to compressors and many other types of essential equipment.

As well as supplying the necessary ChemControl pellets and filtration units, we conduct comprehensive analysis of the ambient air (Viledon® ChemDetect), perform regular analyses of the remaining lifetime of the pellets in use and build specifically designed filtration systems. In addition, we provide a monitoring support service (Viledon® ChemWatch) to ensure that your system is always functioning at maximum efficiency.

Our areas of competence in gas phase filtration

- Pulp and paper
- Petrochemicals
- Mining and smelting
- Chemicals
- Pharmaceuticals
- Data centers
- Laboratories
- Microelectronics
- Fertilizers

Reliability – the basis for long-term partnership

The global reputation for quality, reliability and cost-effectiveness that our filtration systems enjoy is complemented by our proactive approach to partnering with our customers to achieve successful long-term solutions to their gas phase filtration challenges.

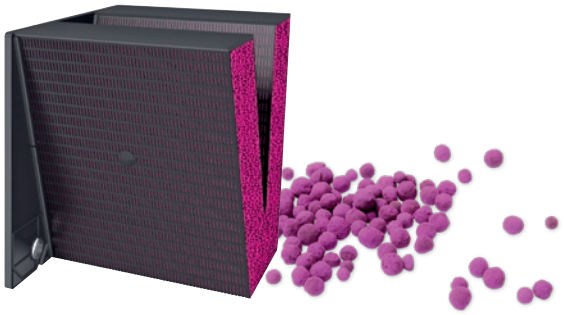
FREUDENBERG FILTRATION TECHNOLOGIES

YOUR PARTNER FOR COMPLETE FILTRATION SOLUTIONS

Freudenberg Filtration Technologies is part of the Freudenberg Group and is headquartered in Weinheim, Germany. With more than 2,200 employees around the world, we are a driving force in the fields of air, gas and liquid filtration. Our Viledon® and micronAir® brands are synonymous with high-quality filtration systems for industrial, automotive and consumer applications.

Air filtration

Our Viledon® range of filters offer reliable and energy-efficient filtration solutions for all industrial air filtration applications.



Gas phase filtration

Our gas phase filtration solutions protect sensitive equipment from the effects of corrosive contaminant gases.

Liquid filtration

We set global quality and product standards in liquid filtration. Our solutions are specifically tailored to the needs of our customers.

viledon®
filterCair

Service

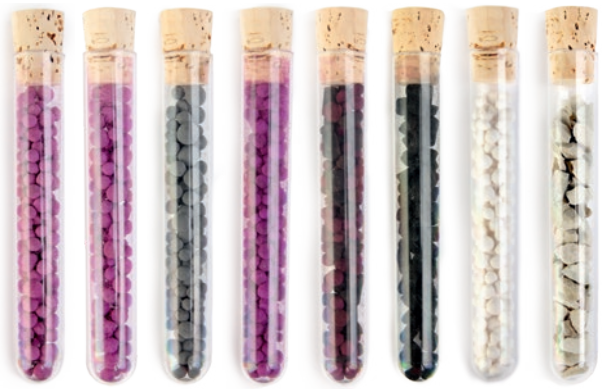
With Viledon® filterCair, we offer our customers a comprehensive and wide-ranging service portfolio to ensure that our filter systems continue to work at optimum efficiency.

Engineering

Viledon® Engineering provides a complete design and installation program for the retrofitting or construction of air filter housings, particularly in the areas of indoor climate control, machine process air and intake air systems for gas turbines.

A COMPREHENSIVE RANGE FROM A SINGLE PARTNER

PELLETS, MODULES, SYSTEMS AND SERVICES

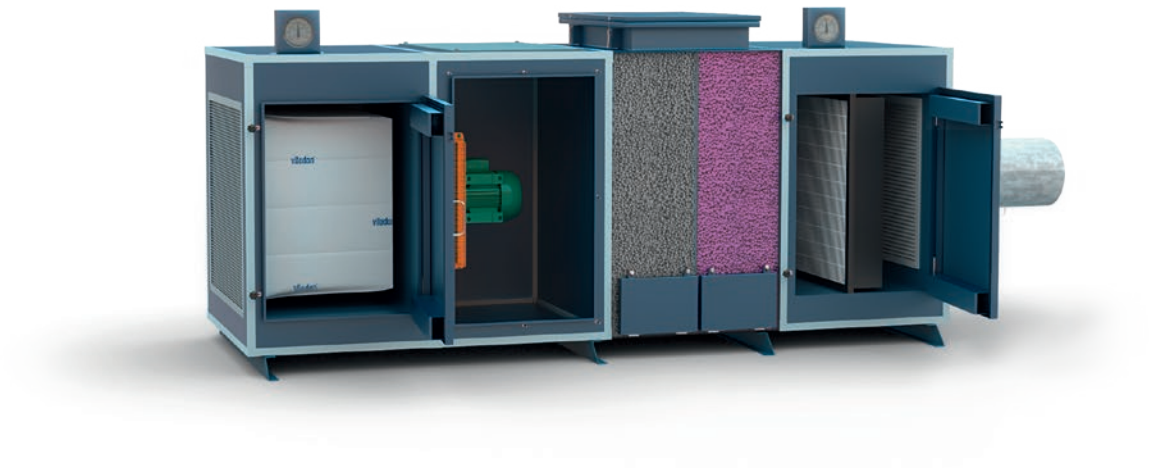


Viledon® ChemControl pellets

The basis of our offering is the quality of the ChemControl pellets used in our systems. We supply a comprehensive range of pellets that reliably eliminate all major contaminant gases. Please check our website for further information on our pellets.

Viledon® ChemControl modules

Viledon® ChemControl modules are the rugged plastic housings that contain our pellets. They are available in four dimensions to suit all applications and are designed for easy handling and replacement. They can be supplied pre-filled or refilled via their easy-access removable caps. The design of your system will determine which size of module you require. As with all Viledon® products, our ChemControl modules offer excellent airflow performance with low pressure drop.



Viledon® ChemControl filtration systems

Our ability to design and manufacture filtration units to meet your precise needs is a key component in ensuring that you achieve maximum return on investment. Viledon® filtration units are designed for both gaseous and particulate removal from supply air, protecting internal components from corrosive contaminants.

Gas phase filtration services

Viledon®'s gas phase filtration services are vital for the continuous protection of process control equipment. Our wide range of services includes Viledon® Chem-Detect Coupon Analyses, Remaining Lifetime Analyses, Viledon® ChemWatch Online Monitoring and our well-known Viledon® filterCair management system.

For further information, please visit our website:

www www.freudenberg-filter.com

TAILOR-MADE SOLUTIONS

ADEQUATE CORROSION PROTECTION FOR YOUR SYSTEMS

Complying with international standards

As well as ensuring that your systems are adequately protected against corrosion – minimizing unplanned downtime, reducing maintenance and protecting your profitability – our systems meet all relevant international quality and performance standards. The most important of these is the International Society of Automation (ISA) standard 71.04 for corrosion levels on electronic and electrical equipment, which is known and respected worldwide (see chart to the right).

FOUR LEVELS TO ASSESS CORROSION SEVERITY ACCORDING TO ANSI/ISA-S71.04

CLASS	SEVERITY LEVEL	COPPER REACTIVITY*	SILVER REACTIVITY*	COMMENTS
G1	Mild	< 300 Å	< 200 Å	An environment sufficiently well-controlled that corrosion is not a factor in determining equipment reliability.
G2	Moderate	< 1,000 Å	< 1,000 Å	An environment in which the effects of corrosion are measurable and corrosion may be a factor in determining equipment reliability.
G3	Harsh	< 2,000 Å	< 2,000 Å	An environment in which there is a high probability that corrosive attack will occur. These harsh levels should prompt further evaluation, resulting in environmental controls or specially designed and packaged equipment.
GX	Severe	≥ 2,000 Å	≥ 2,000 Å	An environment in which only specially designed and packaged equipment would be expected to survive. Specifications for equipment in this class are a matter of negotiation between user and supplier.

*Normalized to a 30-day exposure; 1 Å = 0.1 nanometers = 0.0001 micrometers

Copper and silver reactivity levels measured on ChemDetect Coupons

ANSI/ISA-S71.04 „Environmental Conditions for Process Measurement and Control Systems: Airborne Contaminants“
ISA = International Society of Automation

Technical and service support

As a major international company working with customers around the world, providing comprehensive technical and service support is a key feature of our business. With offices in 30 countries, we have the reach and network to respond quickly to any issues you may have – either remotely or on-site, as necessary.

PREVALENT EXISTENCE OF CORROSIVE GASES BY INDUSTRY	
INDUSTRIAL AND COMMERCIAL ACTIVITIES	**CONTAMINANT GASES**
Airports	H_2S, SO_2, HCN, VOCs, NO_X
Aluminum smelting	HF, SO_2
Fertilizer	HF, NHa, SO_2, SO_3
Food storage	Ethylene
Petrochemical	H_2S, SO_2, mercaptans, NH_3, VOCs, HF, HCl
Ore calcining and furnacing	SO_2, SO_3, HF
Paint and ink	VOCs, formaldehyde
Pulp and paper	ClO_2, Cl_2, H_2S, SO_2
Semiconductor production	HF, NH_3, SO_2, NO_X, VOCs, Acetic Acid, Arsine
Sewage treatment	H_2S, NH_3, VOCs, mercaptans, other sulfur compounds
Steel furnaces and pickling plant	H_2S, SO_2, HF, HCl
Thermal power generation	H_2S, SO_2, NO_X, VOCs
Tobacco smoke	H_2S, SO_2, HCN

END-TO-END CORROSION PROTECTION

THE ONE-STOP-SHOP FOR PURE AIR SOLUTIONS

Viledon® ChemControl systems protect electronic components against corrosion from contaminant gases.

Designed as deep-bed filter systems filled with ChemControl pellets, they supply air that is low in corrosive gases for pressurization of critical rooms. Deep-bed filter systems are particularly used in paper mills, refineries, smelters, steel and chemical plants.

As thin-bed filter systems (positive pressurization units and recirculating air systems) designed to be used with ChemControl modules, they reliably filter the air circulated in control rooms or are used to generate pressurization air in rooms with moderate concentrations of corrosive gases. In addition to the multi-stage ChemControl pellet modules, ChemControl systems also include high-quality Viledon® air filters in classes G 4 and F 7 in accordance with EN 779:2012, as well as a suitable fan.

Complete filtration solutions

We provide everything, from a comprehensive range of pellets and air filters to modules and standard or customized filtration units, enabling us to supply all your needs from a single source.

Recirculating air system

1. Intake of contaminated air
2. Fine filtration
   with Viledon® Compact pocket filter
3. 1st gas phase filtration stage
   Viledon® ChemControl module with pellets
4. Fan
5. 2nd gas phase filtration stage
   Viledon® ChemControl module with pellets
6. Prefiltration
   with Viledon® MaxiPleat cassette filter
7. Purified air
   free of fine particles and contaminant gases

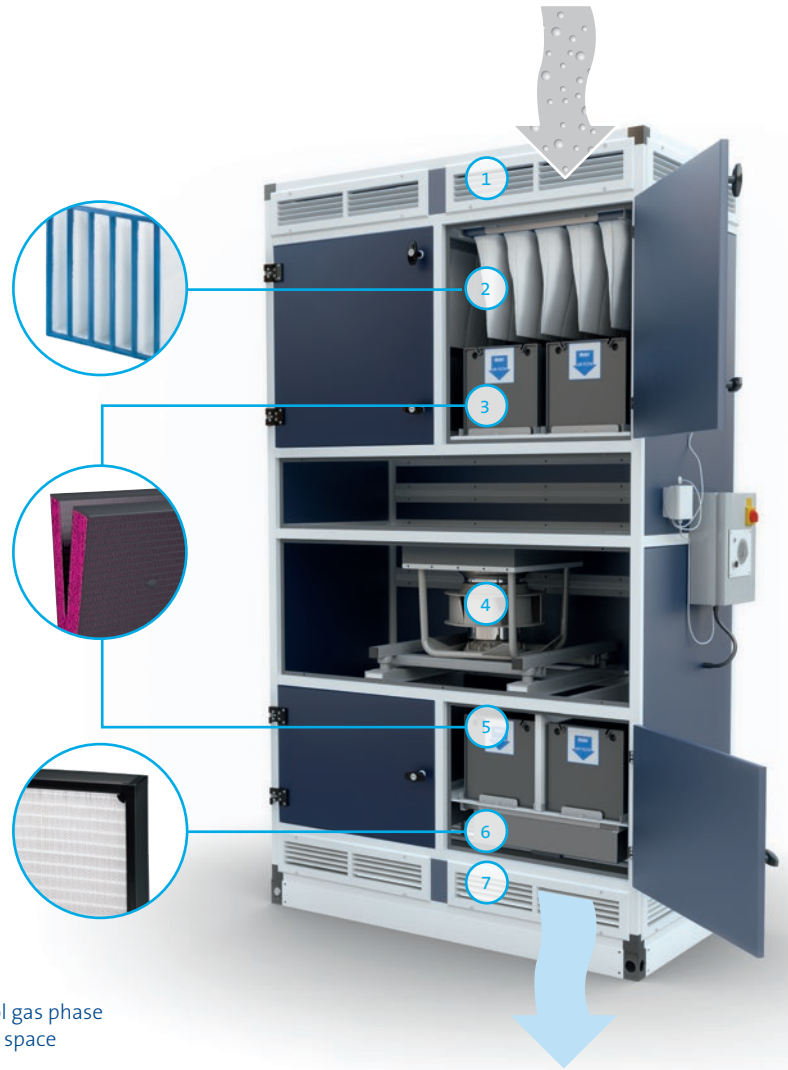


Figure:
Example illustration of a complete Viledon® ChemControl gas phase filtration system for recirculating air inside the protected space

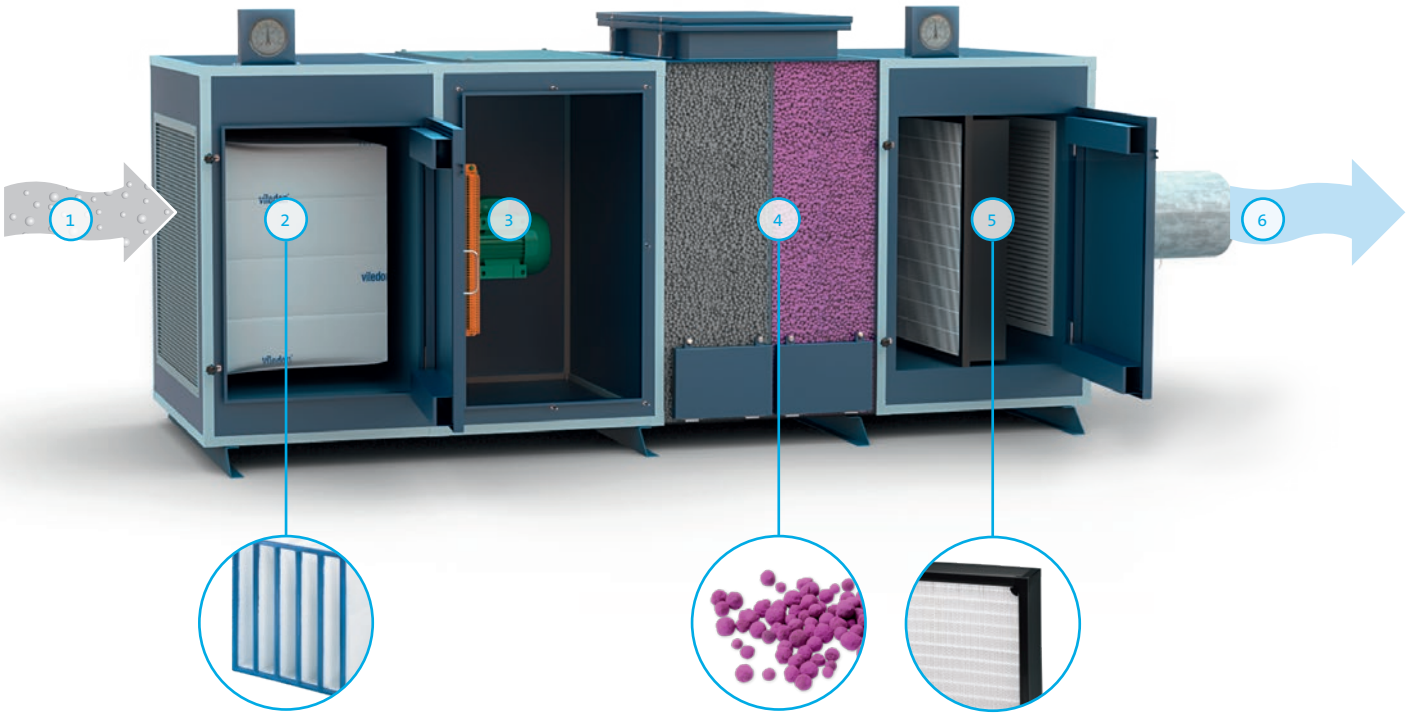


Figure:
Example illustration of a complete Viledon® ChemControl gas phase filtration system for supply air into a protected space

Deep-bed filter system

1. Intake of contaminated air
2. Prefiltration
   with Viledon® Compact pocket filter
3. Fan
4. Deep-bed
   1st and 2nd gas phase filtration stage
   with Viledon® ChemControl pellets
5. Fine filtration
   with Viledon® MaxiPleat cassette filter
6. Purified air
   free of fine particles and contaminant gases

Specifying and building your system

Once we have established your requirements, we work with you to choose the most appropriate pellets, fixtures and fittings. Depending on the exact nature of your processes, we then select the ideal combination of filter elements, housings and units needed to construct an integrated, end-to-end system. Because we manufacture all our own units, we can also adapt your system to fit any space or other restrictions.

Viledon® ChemWatch

Continuous monitoring of your system is the only way to ensure that it is always providing the protection you need. Our Viledon® ChemWatch device constantly tests air quality, temperature, humidity and corrosion levels, feeding the results back to you in real time. This ensures that you always know when it is time to change the pellets or take other corrective action.

FREUDENBERG FILTRATION TECHNOLOGIES

Contact us

www.freudenberg-filter.com

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