

Ahlstrom 奥斯龙

Driving Sustainability in Filtration with high performance Innovations
致力于 高性能过滤材料 可持续发展和创新

FSA China, Dec.2024
Johnny Zhang

We are the Sustainable
Specialty Materials Company

 AHLSTROM



**We Purify and Protect
with Every Fiber
for a Sustainable World**
每一根纤维 都致力于 净化和保护 可持续发展世界

 **AHLSTROM**

More than 170 years of industrial leadership

170年 企业历史

2022

Accelerated strategy execution. Reorganization of Decor business ownership. Business name change to Ahlstrom.

2021

Ahlstrom-Munksjö becomes a privately held company. Strategic initiatives to unlock the full potential of the company.

2018

Acquires U.S. based Expera Specialty Solutions and Brazilian Caieiras specialty paper mill.

2017

Ahlstrom and Munksjö merge into Ahlstrom-Munksjö.

1851

Ahlstrom was established in 1851 in Finland and Munksjö 1862 in Sweden. Both companies have roots in the forest industry.





A global leader in fiber-based specialty materials

EUR
3.0
billion

**Net sales
in 2023**
PRO FORMA

7 000

Employees
WITH OVER
50 NATIONALITIES

37

Plants
IN 13 COUNTRIES

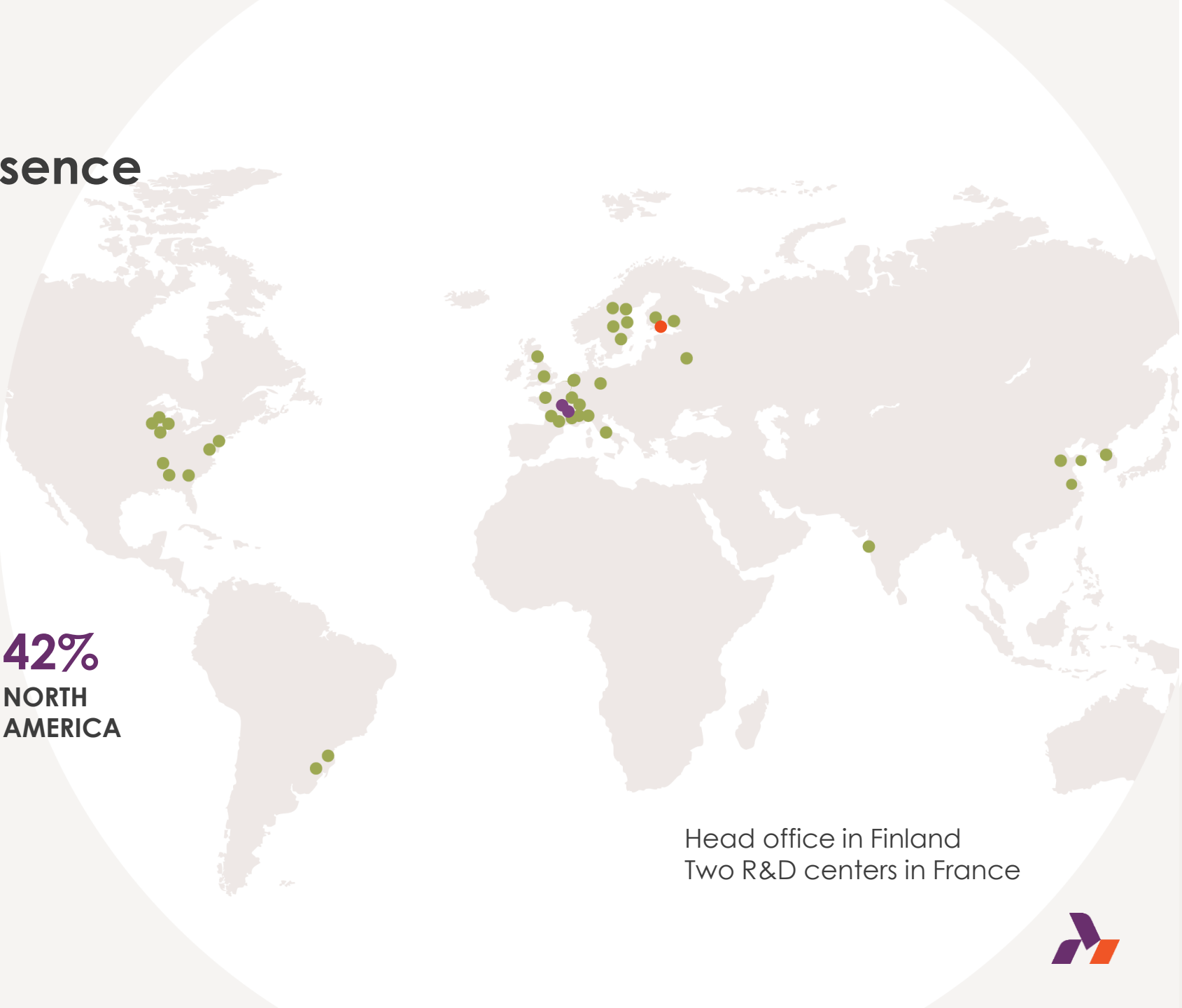
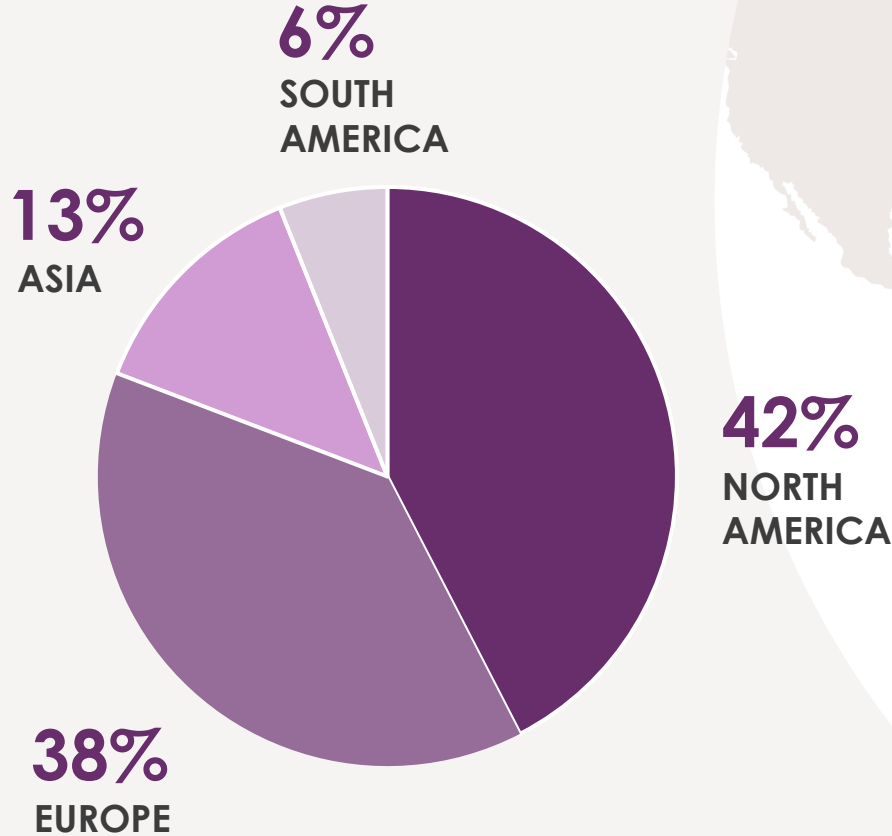
6 000

Customers
IN OVER
100 COUNTRIES



We have a global footprint and local presence

Geographical split of Sales in 2023



Our three divisions are aligned to address global trends

三大业务板块

FILTRATION AND LIFE SCIENCES 过滤和生命科学



Ahlstrom's "purifying" powerhouse with mission critical air and liquid filtration applications and life science and medical solutions.

Aims to expand in industrial filtration and bioprocessing.

FOOD AND CONSUMER PACKAGING 食品和消费品包装



Solutions for improved food safety, product protecting, preservation, and bacteria prevention.

Ambition to lead the transition from single-use plastic to more sustainable packaging leveraging new barrier solutions and high-performance materials that are safe and sustainable by design.

PROTECTIVE MATERIALS 保护性材料



Highly engineered materials for protecting every surface of the building, and specialty materials for electrotechnical and other industrial applications.

Ambition to offer sustainable solutions for the decarbonization of buildings and industrial electrification and grow in niche, high-performance industrial applications.



Operational excellence & global footprint in manufacturing



Air Filtration Application 空气过滤应用

Automotive 汽车行业

Engine Air

Cabin Air

Fuel Cell Air Intake

Cellulose with phenolic or acrylic impregnation

Activated Carbon media w/wo Meltblown

Activated Carbon media with Meltblown

Cellulose with nano or fine fibers

Synthetic media w/wo Meltblown

Industrial 工业

Air Pollution Control

Gas Turbine

HVAC / HEA

Air Oil Separation

Evaporative Cooling

CellTech APC, Nano APC, StatGuard®

CellTech GT, Nano GT, FineFiber GT

Glass HVAC, Glass HEA

Glass AOS

Impregnated Glass Fiber Tissue

Synthetic APC

Trinitex® GT

Trinitex® HVAC

Impregnated Craft Paper

Extia®, AS, Nano & ePTFE

Synthetic GT w/wo. Nano

Extia® HEA

Glass GT, SYN & DUAL

Molecular



Liquid Filtration Application 液体过滤应用

Automotive 汽车行业

Engine Oil	Fuel	Transmission & Cooling
Cellulose (& Synthetic &/or Glass) with phenolic impregnation	Cellulose (& Glass) with phenolic impregnation	Synthetic Transmission
Trinitex® Oil	Laminated with FF	Trinitex® Transmission
		Glass Transmission

Industrial 工业

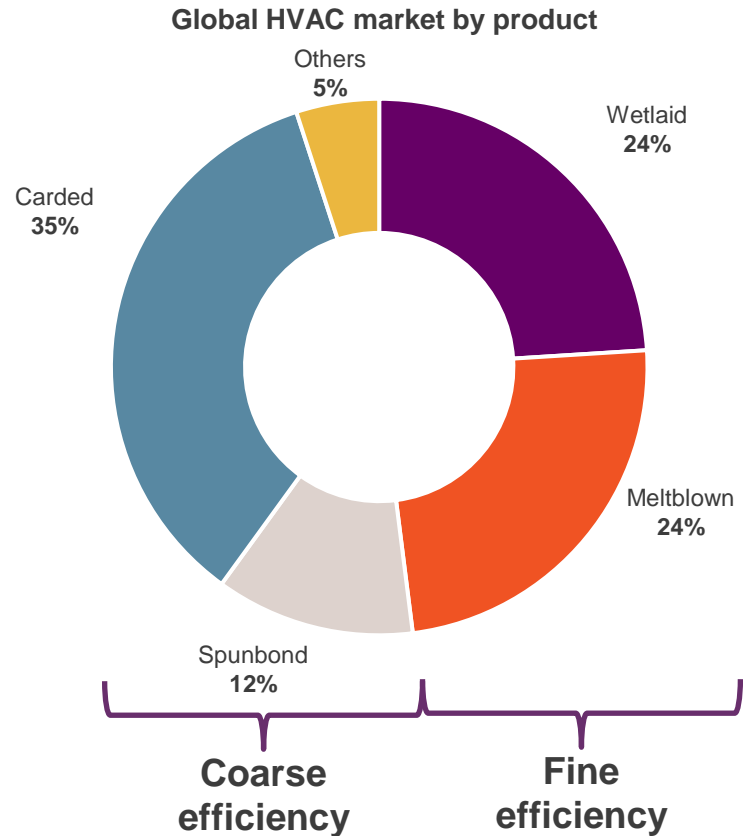
Hydraulic & EDM	Food & Beverage	Process Liquid	Drinking Water
Cellulose Hydraulic	Cellulose platform	Extia® for liquid	Disruptor®
Trinitex® Hydraulic	Trinitex® for liquid	Biospun™	FineFiber for liquid
Glass Hydraulic	FineFiber for liquid	Glass for liquid	



Heating, Ventilation & Air Conditioning Filtration (HVAC)



Market overview 市场情况



- A global market estimated at 100 kt.
- Asia > Americas = EMEA in terms of global market volume.
- Wetlaid media is used for medium to highest filtration efficiencies (no electrostatic charge), mainly **glass fibers**.
- Overall growing market with an estimated Annual Growth Rate of **+6% worldwide**.



Trends in HVAC filtration 行业趋势

Trends	Ahlstrom portfolio
Move towards higher particulate efficiencies (at least ePM1 50%, MERV 13)	Complete range of glass and synthetic solutions
Clear focus of administration and people to reduce energy consumption of the HVAC filtration units (Eurovent)	New glass HVAC energy saving grades and development of nano fiber-based solutions
Increasing demand for media to protect against gases (VOCs, SO ₂ , NO _x , ...)	Wide portfolio of filter media containing activated carbon and new investment to cover complete range of customer needs
Improved sustainability by using more sustainable raw materials	PFAS/C6 free and PLA Spunlaid solutions under validation



Ahlstrom HVAC air portfolio 产品系列

Glass HVAC

A glass microfiber wetlaid media with superior sheet formation.

- ✓ From **Coarse** to **ePM1** rating*-
mechanical filtration
- ✓ Good dust holding capacity & pressure drop build-up
- ✓ Best pleating quality
- ✓ Superior repellency

Optional

Dual layer for higher DHC
High synthetic fiber content for higher mechanical strength
Embossable

NEW

Glass HVAC Energy Saving

A glass microfiber wetlaid media designed to reach the lowest energy consumption.

- ✓ From **Coarse** to **ePM1** rating*-
mechanical filtration
- ✓ **Lowest pressure drop**
- ✓ Better dust holding capacity & pressure drop build-up
- ✓ Best pleating quality
- ✓ Superior repellency

Optional

Embossable

Pleat2Save®

A unique single step 3-layer synthetic media with glass in the middle layer

- ✓ From **Coarse** to **ePM1** rating*-
mechanical filtration
- ✓ Superior pleating performances
- ✓ Optimal mechanical strength and durability even in wet conditions



Ahlstrom HVAC Portfolio 产品系列

These references represent only a selection of the most popular HVAC grades in the portfolio.
The following template is based on equivalence between EN779 and ISO16890:2016

Recommended Class (EN779)	Recommended Class (ISO16890:2016)	Standard Glass	NEW A Glass	Pleat2Save™
Key highlights	Key highlights	Filtration performance	Energy savings	Pleating performances
M5	ePM10 50%	55ASM1050T	-	P2S-M5*
M6	ePM10 65%	65ADF601T	65ADF601AT	P2S-M6*
F7	ePM1 55%	80ASF701T	80ASF701AT	P2S-PM155*
	ePM1 60%	80ASM160T	80ASM160AT	-
F8	ePM1 65%	90ASF801T	90ASF801AT	-
	ePM1 70%	90ASM170T	90ASM170AT	P2S-F8
F9	ePM1 80%	90ASF901T	90ASF901AT	P2S-F9

*FR treatment available upon demand



High Efficiency Air Filtration Media

高效空濾



Ahlstrom HVAC air portfolio

Glass HEA

A glass media offering full mechanical efficiency.

- ✓ From **E10** to U16 rating - **mechanical** filtration
- ✓ High dust holding capacity
- ✓ Low pressure drop

Optional

Oil repellency - Water repellency
Dual layer for higher DHC
Higher strength media
Antimicrobial properties

Extia®

A 100% synthetic media laminated with a high efficiency ePTFE membrane

- ✓ **H13 to H14** rating* - **mechanical** filtration
- ✓ Low pressure drop
- ✓ High water repellency




Ahlstrom Glass High Efficiency Air Portfolio

Class	Std Glass (EN1822)	Std Glass (Mil-std-282)	-A Glass	EXTIA
Key highlights	Filtration performance	Better efficiency	Energy savings	Glass free
E10	DOPH10 01	DOPH10 03 (85%)	-	-
E11	DOPH11 01	DOPH11 03 (95%)	-	-
E12	HEPH12 01	HEPH12 03 (99.92%)	HEPH12 01 70	-
H13	HEPH13 01	HEPH13 03 (99.97%)	HEPH13 01 70	EXTIA1302N
H14	HEPH14 01	HEPH14 03 (99.99%)	HEPH14 01 70	EXTIA1301N
U15	ULPU15 01	-	-	-
U16	ULPU16 01	-	-	-
01 refers to EN1822 rating @ 1,7 cm/s & 03 refers to efficiency for 0.3 µm @ 5.3 cm/s				

Optional HWR (water repellent) , AMV (antimicrobial), M20 (one side lamination), B20 (Two sides lamination)





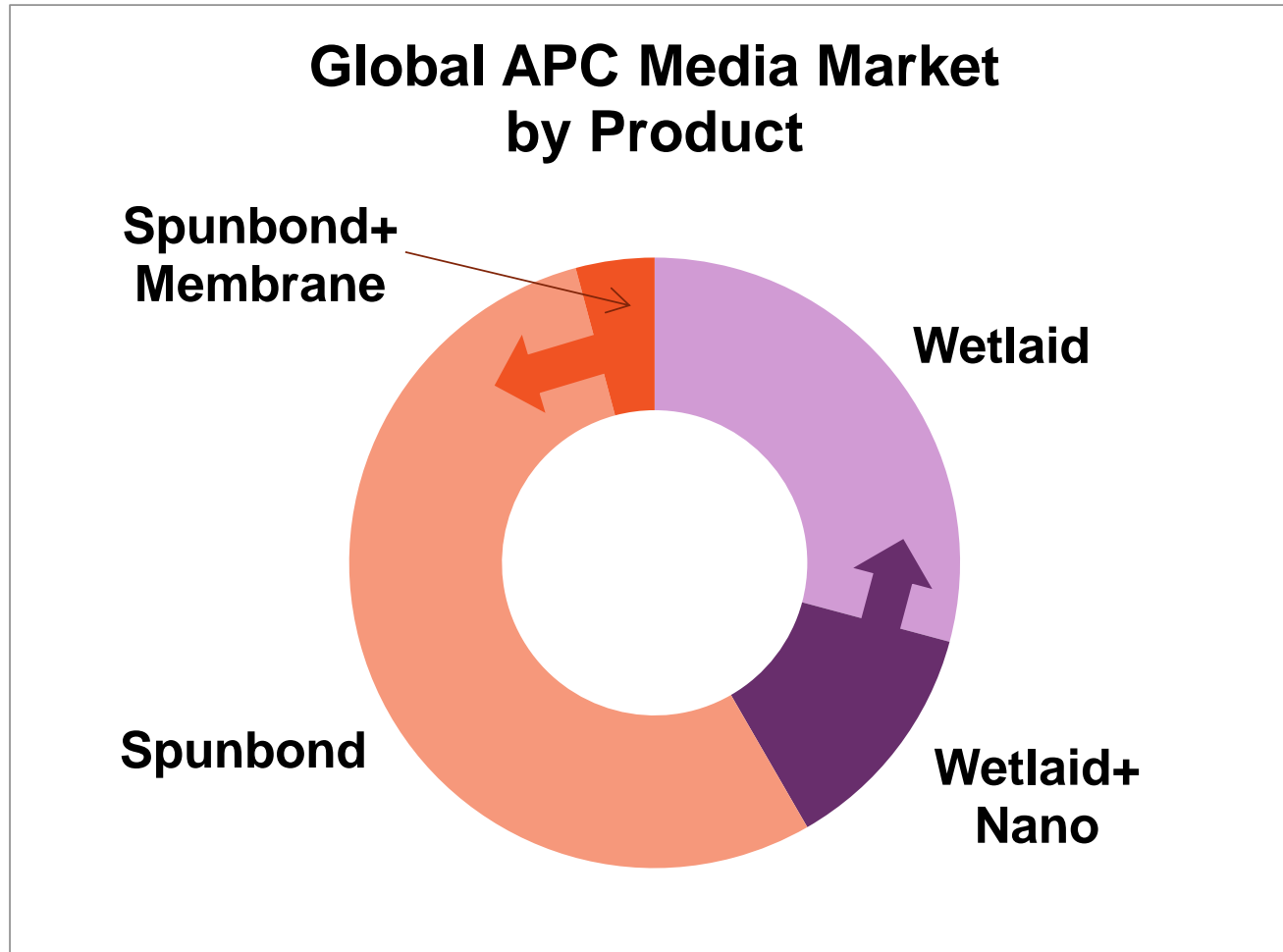
Ahlstrom

**Air Pollution
Control Filtration
Media**

Purifying Air
Protecting People

粉尘回收

Market information – Air Pollution Control Filtration Cartridge 市场情况



Source: internal estimate

Cartridge filters represent only 15% of the overall APC filter market (250kt).

Asia is driving the market. High efficiency media are growing the fastest.



In a nutshell, Ahlstrom APC Portfolio 产品系列

Product	Recommended when	Dust Concentration	Particle size	Explosion risk	Application example
CellTech APC	Dry	Low	Coarse	No	Coarse sand blasting
Nano APC	Dry	Medium	Fine	No	Metal works / powder coating
Statguard®	Dry	Medium	Coarse / Fine	Yes	When explosives dusts
Synthetic APC	Moisture	Medium	Coarse / Fine	No	Chemical industries
Extia®	Moisture	High	Fine	No / Yes	Metal works / challenging uses

- A **single source provider** of filter media solutions for air pollution control cartridges.



Wetlaid



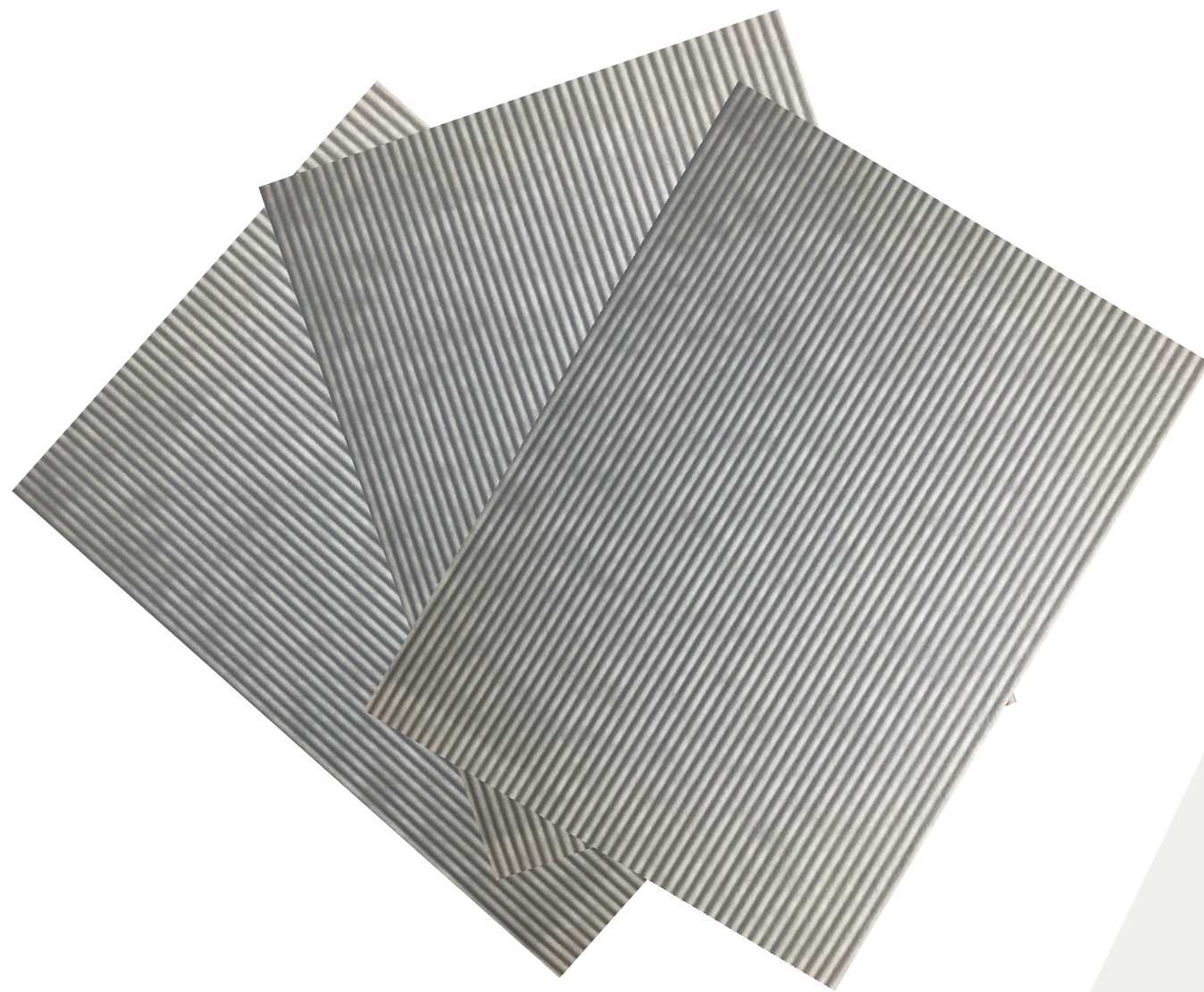
vs. Spunbond



Ahlstrom CellTech APC 木浆系列

Benefits

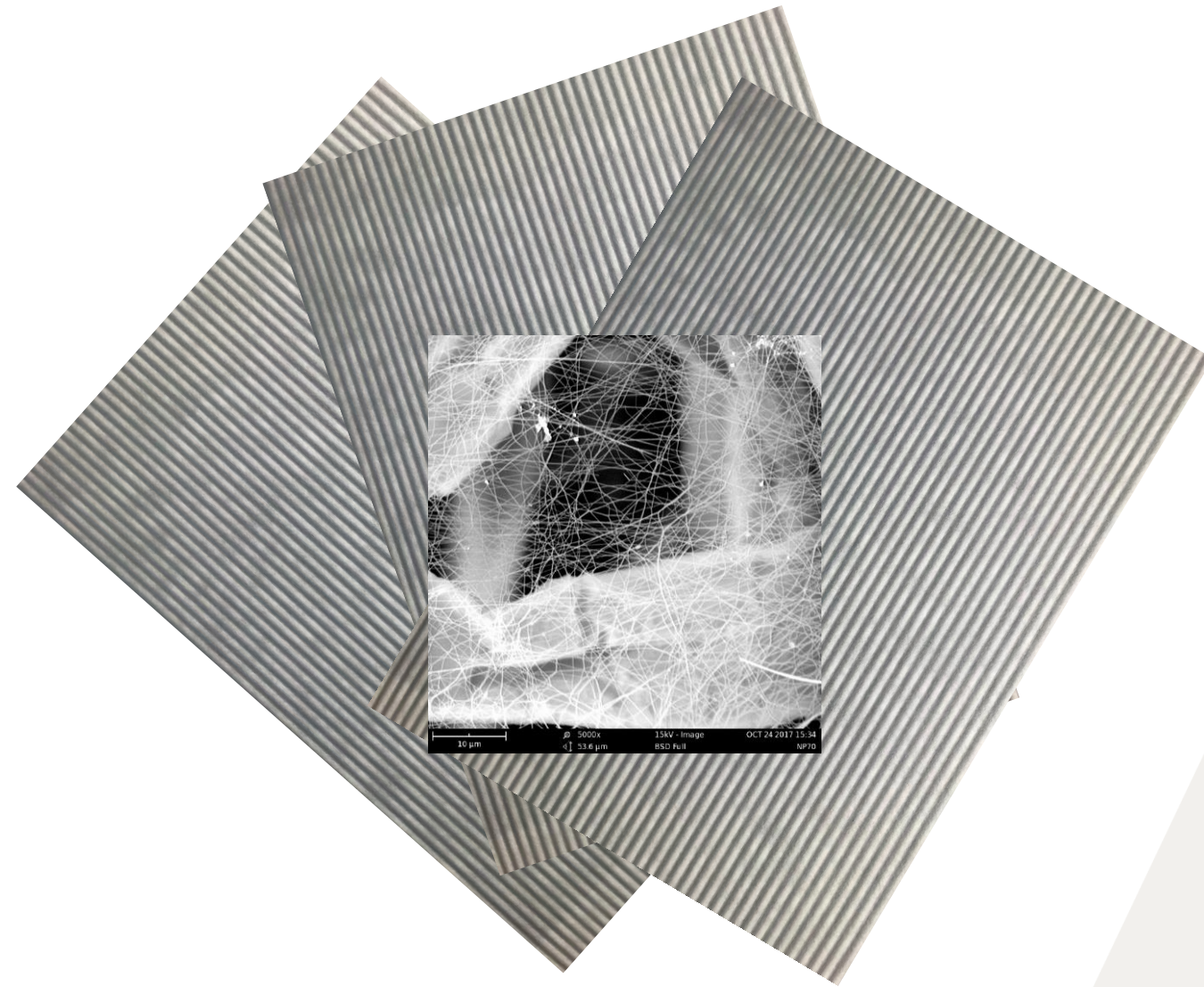
- ✔ **M class according to EN60335** – delivering high protection against coarse particles.
- ✔ **Optional flame retardant features** – delivering better protection when sparkles can occur.
- ✔ **Excellent pulse jet durability** – delivering longer time between service intervals.
- ✔ **High corrugation** – offering ideal performance for pleatability.
- ✔ **Flexible manufacturing capability** – in US, Asia and EMEA.



Ahlstrom Nano APC 纳米系列

Benefits

- ✔ **Highly efficient on fine particles** – the nano layer protects the base media against fine particles migration and reduce the emissions to the atmosphere.
- ✔ **Delivers longer lifetime** – due to optimal pulse cleaning properties.
- ✔ **High Corrugation** – offering excellent pleating performance.
- ✔ **Optional flame retardant features** – delivering better protection when sparkles can occur.
- ✔ **Benchmark APC** – solution for various industries such as metal work, blasting, welding fumes...



Ahlstrom StatGuard® 导电系列

Benefits

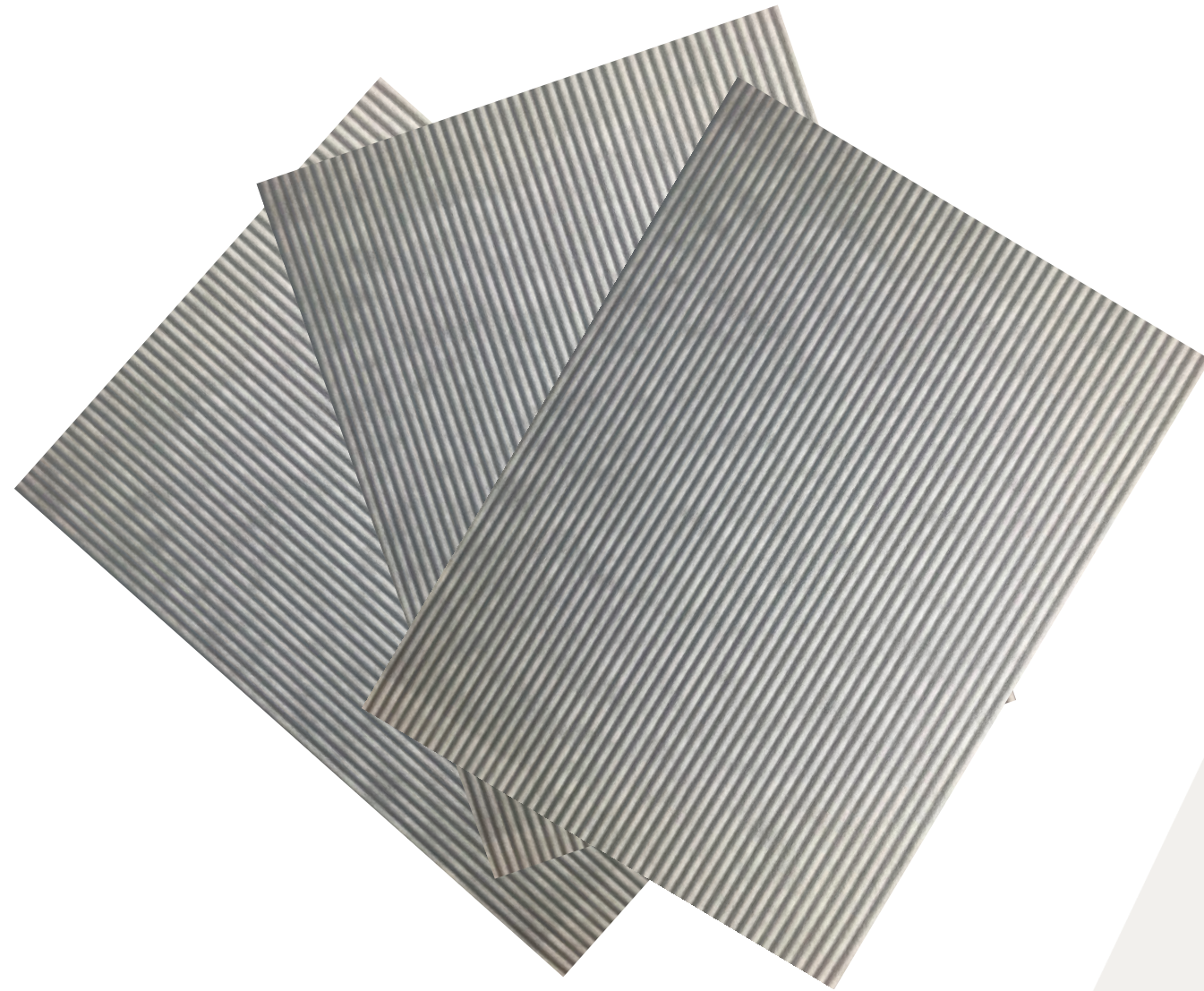
- ✔ **Flame retardant and dissipative** – Matching the most demanding explosive industrial process requirements.
- ✔ **Dissipative in all directions** – core treated media keeping antistatic properties along the whole filter life.
- ✔ **High Corrugation** – offering ideal performance for pleatability.
- ✔ **Nanofiber optional** – delivering higher efficiency on fine particles, low pressure drop and better dust cake release for best and longer filtration performance.



Ahlstrom Synthetic APC 全合成系列

Benefits

- ✔ **Full synthetic design** – Better behavior in humid conditions; improved temperature and abrasion resistance.
- ✔ **Low basis weight and isotropic structure** – increasing effective filtration surface for a lower air-to-cloth ratio.
- ✔ **High Corrugation** – offering ideal performance for pleatability.
- ✔ **Nanofiber optional** – delivering higher efficiency on fine particles, low pressure drop and better dust cake release for best and longer filtration performance.



Ahlstrom Extia® APC – 全合成复合系列

Benefits

- ✔ **Outstanding durability** - Extia® intrinsic strength and strong bonding with nano fibers or ePTFE membrane.
- ✔ **Isotropic media** - 20% to 30% more effective filtration surface compared to point-bonded spunbond.
- ✔ **Extended filtration lifetime** - excellent dust cake release combined with optimal air-to-cloth ratio.
- ✔ **Highly efficient on smallest particles** - protecting the base media against fine particles migration and reducing the emissions to the atmosphere.
- ✔ **Direct replacement for spunbond polyester** - better efficiency than spunbond polyester media at a lower basis weight.

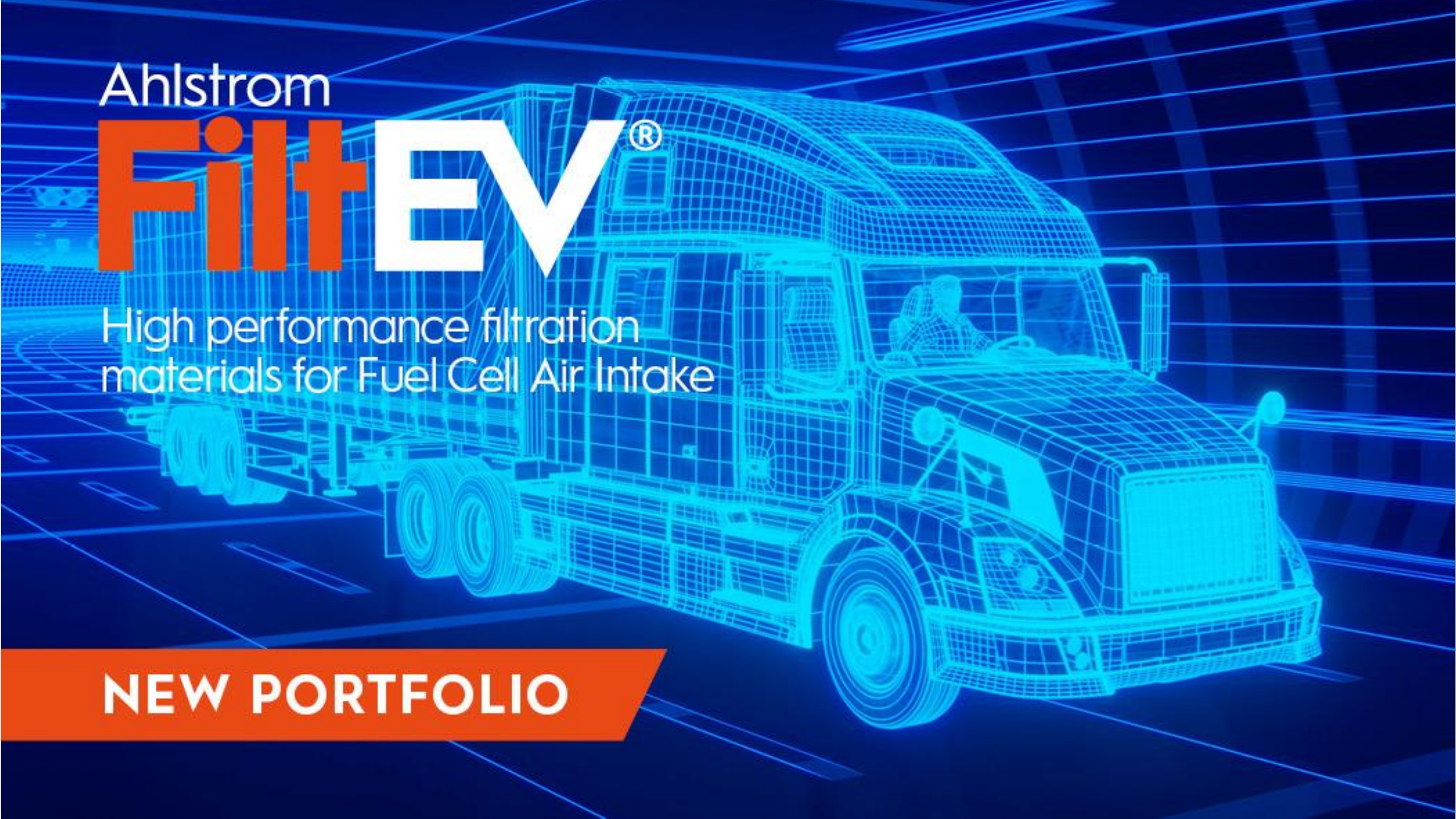


Ahlstrom

FiltEV[®]

High performance filtration
materials for Fuel Cell Air Intake

NEW PORTFOLIO



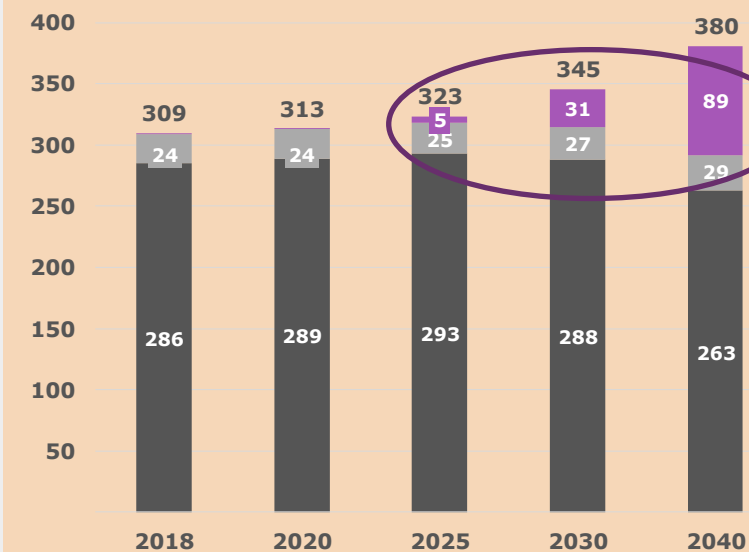
The growth of automotive filter demand is driven by EV 电车 过滤需求

Why to invest in EV Filtration?

- >1M electrified cars sold every month in 2021 (25% is Battery or Fuel Cell EV).
- Global BEV LV production will reach up to **25M in 2030** (25% share). Fleet would represent **160M units (10%)**.
- Global Full EV MHD production will reach up to **500k in 2030** (11% share). 150k will be FCEV, 350k will be BEV.

Global filter demand by filter applications in k tons

Total change 2018 to 2030: +12%



5,000t media more,
every year from 2025

- Engine-related filter media (Air intake, oil filter, fuel filter)
- Remaining filter media (cabin air filter)
- New filter media demand (new ICEE, PHEV, BEV/FCEV filters)



Ahlstrom offer for FCEV, 4 segments 电车过滤系列

CABIN FILTER

Particulate filter up to HEPA & Premium Carbon Blue with particulate efficiency layer

COOLING FILTER

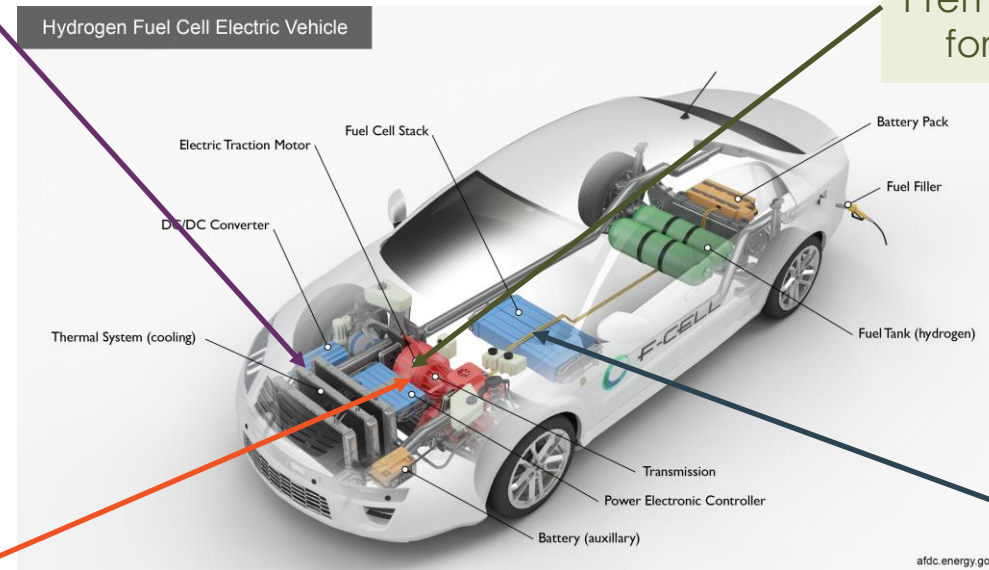
Premium Synthetic offering for Cooling Air and Oil

TRANSMISSION FILTER

Premium Synthetic & Full Glass offering

FUEL CELL AIR INTAKE FILTER

Specific Activated Carbon media combined with a particulate efficiency layer



Trends in fuel cell air intake filtration 燃料电池进气过滤 趋势和产品

Trends	Ahlstrom portfolio
Movement to HEPA (electrostatic) particulate efficiency to limit clogging of channels & proton exchange membrane by finest particles	FiltEV® platform
Movement to extended molecular adsorption ; media delivering the best removal of VOCs, SO ₂ and NO _x adsorption capability for better protection of the catalyst and improved service intervals.	FiltEV® platform
Always higher performance for NH₃ removal	New FiltEV® solutions with ion exchange resin (IEX)



Ahlstrom fuel cell air intake portfolio 燃料电池进气过滤 产品系列

FiltEV® MA Series

An independent dry multi-layer media laminated with a high particulate efficiency layer.

- ✓ **Activated carbon blends** for optimal absorption on **SO₂**, **NO_x** and **volatile organic compounds (VOCs)**
- ✓ **Low thickness** and easy to process

Highly customizable

Wide choice of particulate efficiency layers and activated carbon blend up to 700 gsm

FiltEV® MAC Series

An independent dry multi-layer media laminated with a high particulate efficiency layer.

- ✓ **Activated carbon blends** for optimal absorption on gases **SO₂**, **NO_x**, and **VOCs**
- ✓ **Adsorption extended on NH₃**
- ✓ **Low thickness** and easy to process

Highly customizable

Multiple particulate efficiency
Several activated carbon blend and content up to 700 gsm

NEW

FiltEV® MAI Series

An independent dry multi-layer media laminated with a high particulate efficiency layer.

- ✓ **Activated carbon blends** for optimal absorption on gases **SO₂**, **NO_x**, and **VOCs**
- ✓ **Best NH₃ adsorption with ion exchange resin**
- ✓ **Low thickness** and easy to process

Highly customizable

Multiple particulate efficiency
Several adsorbent blend and content up to 700 gsm



Cabin Filtration

空调滤



Trends in **cabin air** filtration 趋势

Trends	Ahlstrom portfolio
Move towards HEPA particulate efficiency and from electrostatic to mechanical filtration for stable efficiency in time.	SafeCabin® Carbon Dry platform with supported membranes, nano and charged meltblown reaching HEPA.
Increasing demand for combi media to protect against particles but also VOCs and odors.	Full portfolio of filter media containing activated carbon
More demanding adsorption performances on SO₂, NO_x and time to time NH₃	SafeCabin® Carbon Dry* platform with different absorbent mix up to 700g/m²
Movement toward antimicrobial or anti-allergen functionality.	Antimicrobial optional treatment available. Anti-allergen functionality under development.



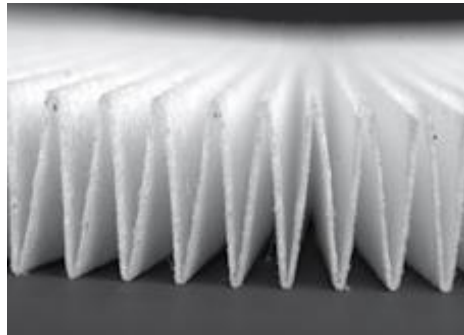
Ahlstrom **cabin air** offering 产品系列

Particulate Cabin

SafeCabin®

SafeCabin®
Charge

Extia®

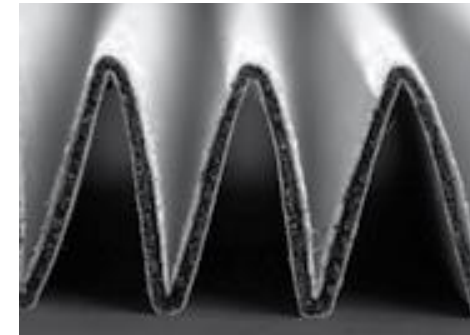


Molecular Cabin

SafeCabin®
Carbon

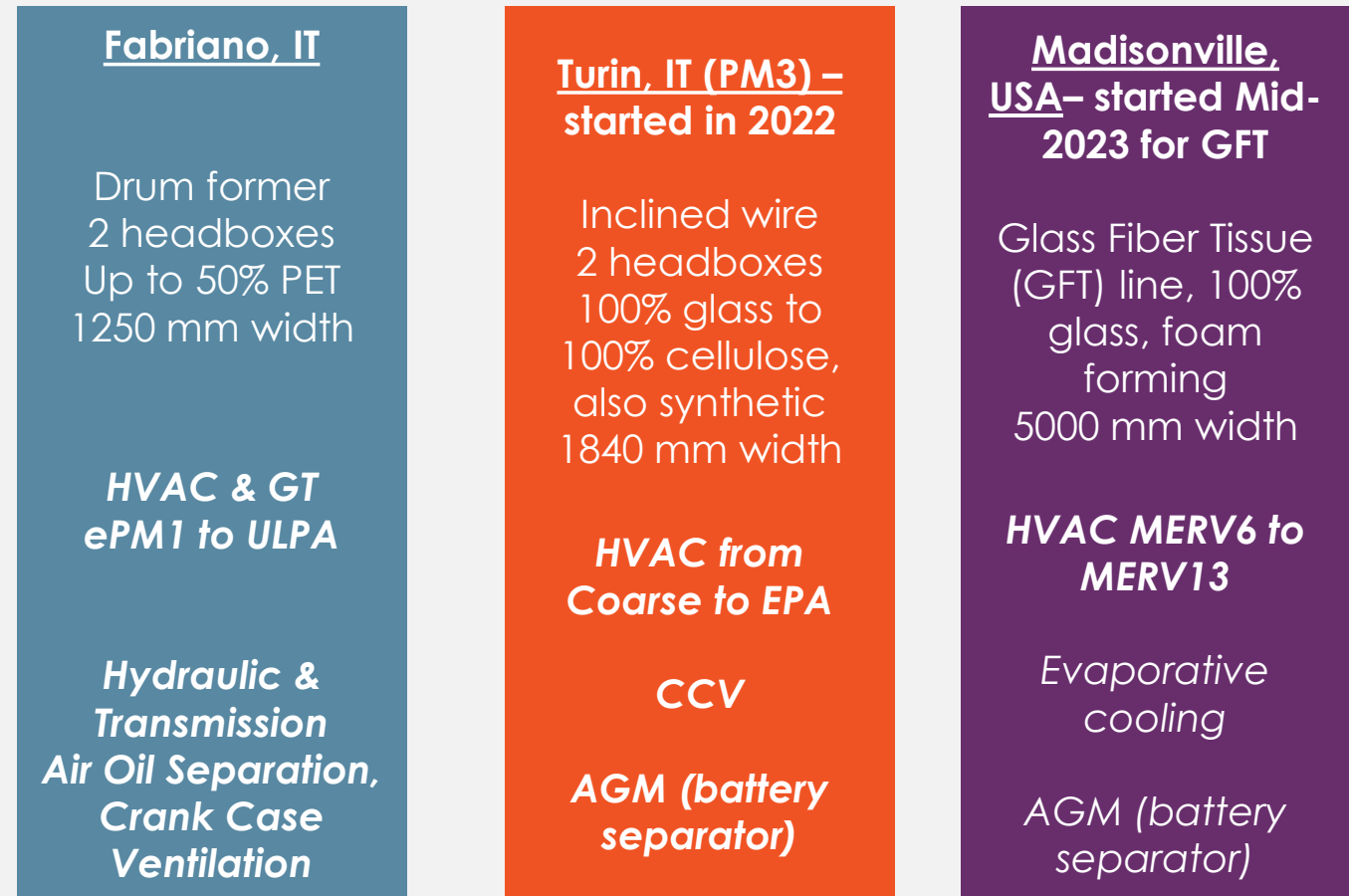
SafeCabin®
Blue Carbon
Charge

SafeCabin®
Carbon Dry*



Ahlstrom Glass Platform 玻纤产线

Increased global capacity & capabilities on Glass media



State-of-the-art lamination capability available in all plants (1- or 2-side spunbond, mesh...)



奥斯龙专场研讨会 Dec.12th, 10-12am --- Hall E2, M18

Welcome to Ahlstrom Filtration Seminar

欢迎莅临 奥斯龙 过滤 材料 技术研讨会

SEMINAR TIME:

December 12th, 2024, 10:00am

研讨会时间:

2024年12月12日 10:00am

SEMINAR LOCATION:

Shanghai New International
Expo Center (SNIEC)
Meeting room **E2 – M18**

Topics covered during the seminar are:

研讨会主题：

- ✔ Welcome and Ahlstrom Group Overview
欢迎致辞及奥斯龙集团介绍
- ✔ Dual layer filtration solution
奥斯龙双层过滤技术方案
- ✔ Ahlstrom FiltEV® (Cabin air, Transmission and Molecular)
奥斯龙 FiltEV® 系列：空气舱、变速箱、燃料电池进气及活性炭材料
- ✔ Industrial Filtration: GT, HVAC, AOS, High Efficiency Air, Liquid including PFAS-FREE solutions
奥斯龙工业过滤：燃机、HVAC、油气分离、高效空滤、液体过滤，包括无氟过滤方案



OVER 50 YEARS
DEDICATED TO
**THE FUTURE
OF FILTRATION**

