Nano Convergence Filter

Technology explanation

CALAB
Clean Air Laboratory

Aero Hybrid Filter ™

Company Introduction

Let's make a society where everyone breathes clean air

CALAB believes that air, which anyone could drink freely, is no longer a public good but a consumer good due to pollution. We strive to help many people breathe clean air through more effective and economical solutions. CALAB wants to go one step further and improve the air quality of all the spaces we stay in. We want to create a better future where we can breathe clean air with CA Lab's products everywhere from our homes to offices, cars to the outdoors.

Company history and major certificate

2019
Established CALAB
Started production of vent filters

2020
2020
Corporate transformation

2021
Started production of replaceable mask
Selected as SMEs Ministry's TIPS
Selected for R&D for dust reduction project
Selected for Start-up Leap Package project
FDA Approved for mask lineups

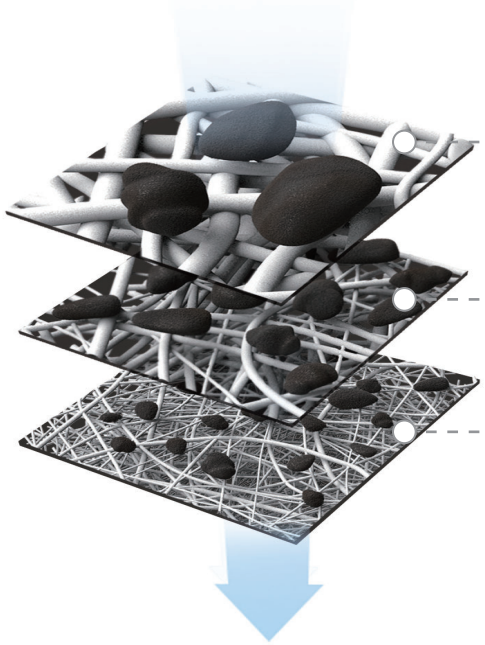
2022
2022
Launched clean-tech brand 'AEREA'
Start production of air cabin filter
Start production of Nano convergence filter material
Selected for environmental vendor project
Selected for Busan's clean air project
Selected as Innovative products for procurement
Selected as environmental company by ministry

2023
Busan subway air filter
Ministry of National Defense air filter
Coast Guard air filter
Global shipping company air filter
Global electronics company air filter
Selected as 'Green Technology' for filter

ISO
Green Certification
K-innovative Product
Brand K
Win-Win Corporation Product
Start-up
Venture Enterprise
G-PASS

Technology Overview & Differentiation

Filter Material Overview



Multi-Fiber Layer

Remove pollen & large dust
improve filter life

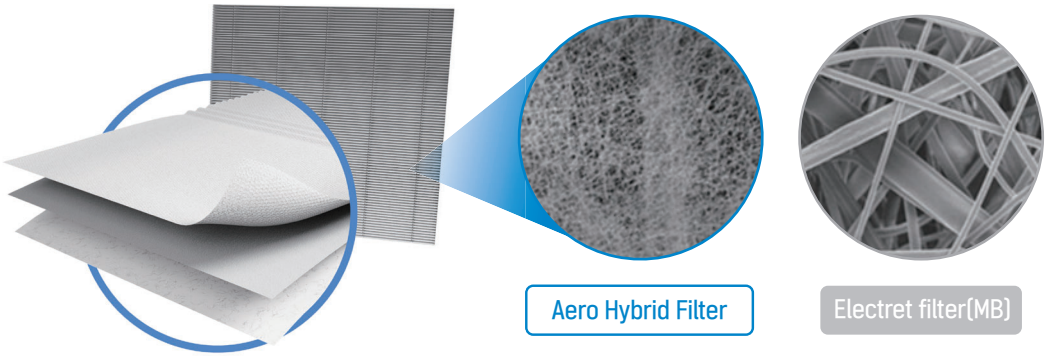
Electret Fiber Layer

Remove fine dust with low pressure
and high efficiency filter

Nano Fiber Layer

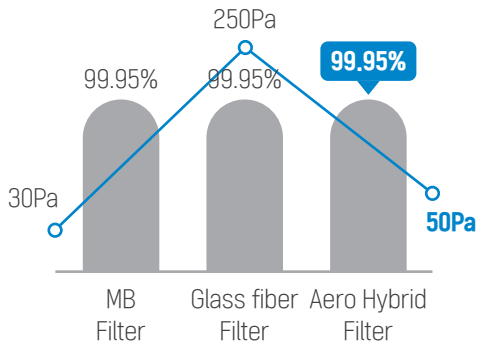
Block germs and viruses
Prevent efficiency degradation

Comparison of filter structures compared to existing material



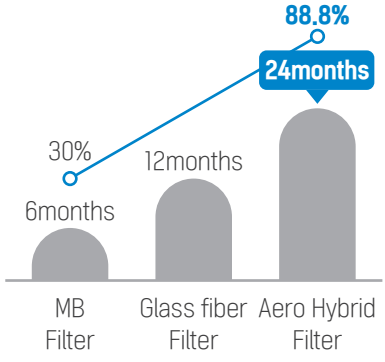
Comparison with existing filters

Filter's dust collection efficiency & pressure drop



Efficiency level ● Pressure drop level

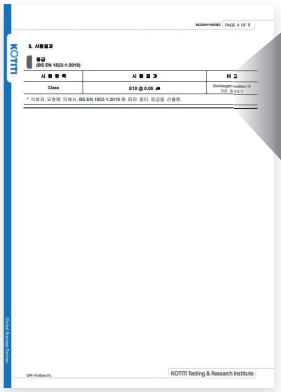
Lifespan & virus reduction rate



● Filter's Lifespan ● Virus reduction rate

Comparison of Technology

Dust collection efficiency | Reliability



▲ Efficiency Test Report

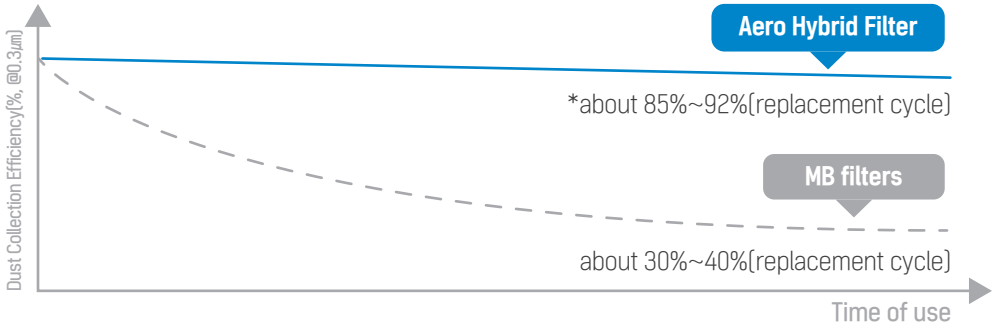
Filter Class
(BS EN 1822-1:2019)

Test Items	Test Results	Remark
Class	E10 @ 0.05 ㎛	Class by discharged condition

* At the request of the client, the filter classified according to BS EN 1822-1:2019.

Without loss of static power due to moisture contact in the air, the physical filtration power of the nanofilter layer enables **at least 85% performance reliability even after the performance degradation of the electrostatic filter layer.**

*Test standard : ISO29463 / EN1822
Test agency : KOTITI



Virus protection performance

▲ Virus reduction Test Report

1. Test Results

Unit \ Result	Airborne Virus reduction rate
Air Filter	88.8 %

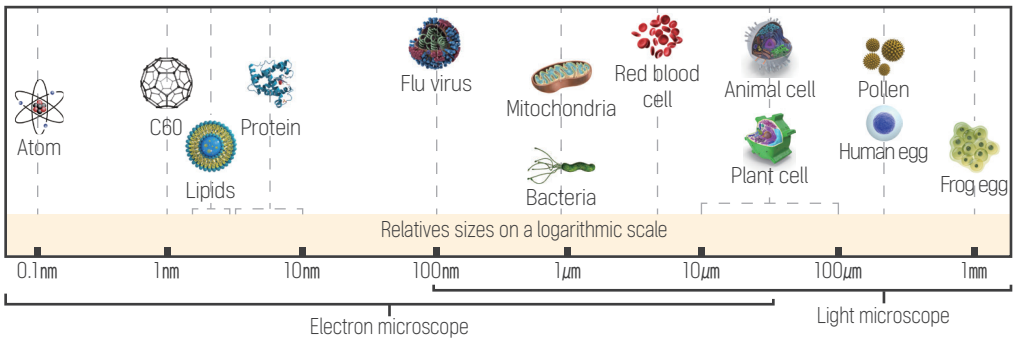
2. Test sample

(1) Manufacturer : CALAB Co.,LTD
(2) Model name : Aero Hybrid Filter, AHN11FF00

Because viruses have a size beyond the fine pores of the nanofiber filter layer, they are collected (*88.8%) without passing through the pores, **and the collected virus is killed without additional reproduction due to moisture contact restrictions by a hydrophobic filtration layer.**

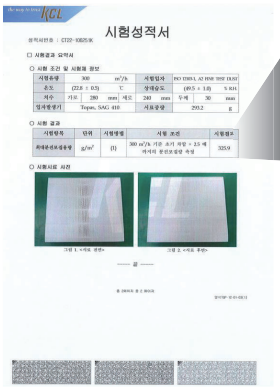
*Test standard : KOUVA AS 02
Test agency : KTI

Note) Size of virus : >0.1㎛
Size of Nano fiber filter : 0.1㎛



Aero Hybrid Filter™

Max. 4 times longer life


시험성적서

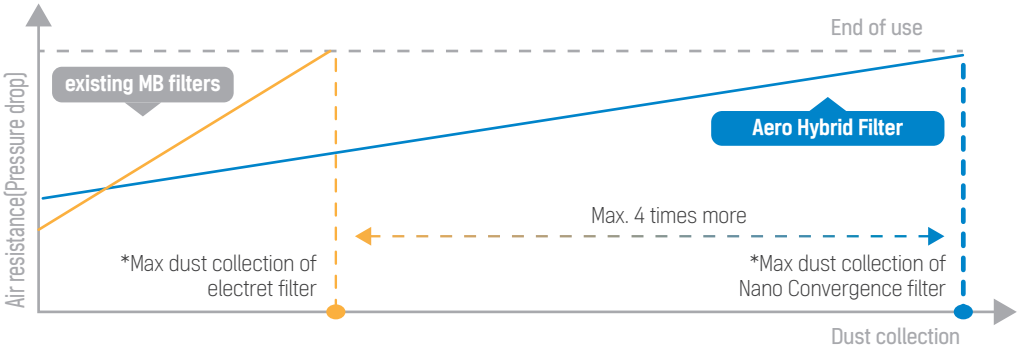
○ 시험 결과

시험항목	단위	시험방법	시험 조건	시험결과
최대분진포집용량	g/m^2	(1)	300 m^3/h 기준 초기 차압 × 2.5 배 까지의 분진포집량 측정	325.9

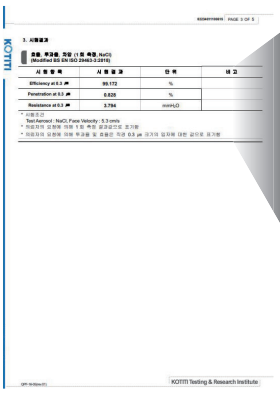
▲Dust Collection Test Report

With the effect of multi-layers, collection subdivision by particle size **minimizes the increase in pressure loss due to dust collection.**

*Test standard : DIN 71460-1
Test agency : KCL



Data Sheet


KOTITI

효율, 투과율, 차압 (1 회 측정, NaCl)
(Modified BS EN ISO 29463-3:2018)

시 험 항 목	시 험 결 과	단 위	비 고
Efficiency at 0.3 ㎛	99.172	%	
Penetration at 0.3 ㎛	0.828	%	
Resistance at 0.3 ㎛	3.794	mmH_2O	

* 시험조건
Test Aerosol : NaCl, Face Velocity : 5.3 cm/s
* 의뢰자의 요청에 의해 1 회 측정 결과값으로 표기함
* 의뢰자의 요청에 의해 투과율 및 효율은 직경 0.3 ㎛ 크기의 입자에 대한 값으로 표기함

▲Particle collection & Pressure drop

Particle collection Efficiency 99.172%, Pressure drop 37.2Pa

*Test standard : ISO29463-3
Test agency : KOTITI

Hybrid Filter Class	Media Layer Structure	Dust Collection Efficiency (@5.33cm/sec)		
		Initial Collection (%)	Pressure drop(Pa)	Final Collection (%)
C10	3 Layers (Surface layer, Nano layer)	85%▲	20~30	85%▲
C11	5 Layers (Surface layer, MB layer, Nano layer)	95%▲	35~45	85%▲
C12	5 Layers (Surface layer, MB layer, Nano layer)	99.5%▲	45~55	85%▲
C13	5 Layers (Surface layer, MB layer, Nano layer)	99.95%▲	60~70	85%▲
C14	5 Layers (Surface layer, MB layer, Nano layer)	99.995%▲	75~85	85%▲
Related standard			ISO 29463-3	

The New Pioneer in Global Filtration Tech.

Leap into No. 1 Clean Tech Company Leading Global Filter Market
CALAB would like to accomplish it with you.

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