Frie foredrag
Rensing av luft med ultrafine partikler

Norsk Yrkeshygienisk Forening
Årskonferansen 27.-29. oktober 2019
Clarion Stavanger

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«Ultra-fine particles»

Up next

An unde
quality

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http://nordic.businessinsider.com/cruise-ship-decks-air-quality-worse-than-most-polluted-cities-2017-10?r=UK&IR=T

Ultrafine partikler påvirke lunger og hjerte-karsystemet

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J Allergy Clin Immunol. 2016 August ; 138(2): 386–396. doi:10.1016/j.jaci.2016.02.023.

A Work Group Report on Ultrafine Particles (AAAAI) Why Ambient Ultrafine and Engineered Nanoparticles Should Receive Special Attention for Possible Adverse Health Outcomes in Humans

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Abstract

Ultrafine particles are airborne particulates of less than 100 nm in aerodynamic diameter. Examples of ultrafine particles are diesel exhaust particles, products of cooking, heating and wood burning in indoor environments, and more recently, products generated through the use of nanotechnology. Studies have shown that ambient ultrafine particles have detrimental effects on both the cardiovascular and respiratory systems, including a higher incidence of atherosclerosis and the exacerbation rate of asthma. Ultrafine particles have been found to alter *in vitro* and *in vivo* responses of the immune system to allergens and may also play a role in allergen sensitization. The inflammatory properties of ultrafine particles may be mediated by a number of different mechanisms, including the ability to produce reactive oxygen species, leading to the generation of pro-inflammatory cytokines and airway inflammation. In addition, because of their small size, ultrafine particles also have unique distribution characteristics in the respiratory tree and circulation and may be able to alter cellular function in ways that circumvent normal signaling

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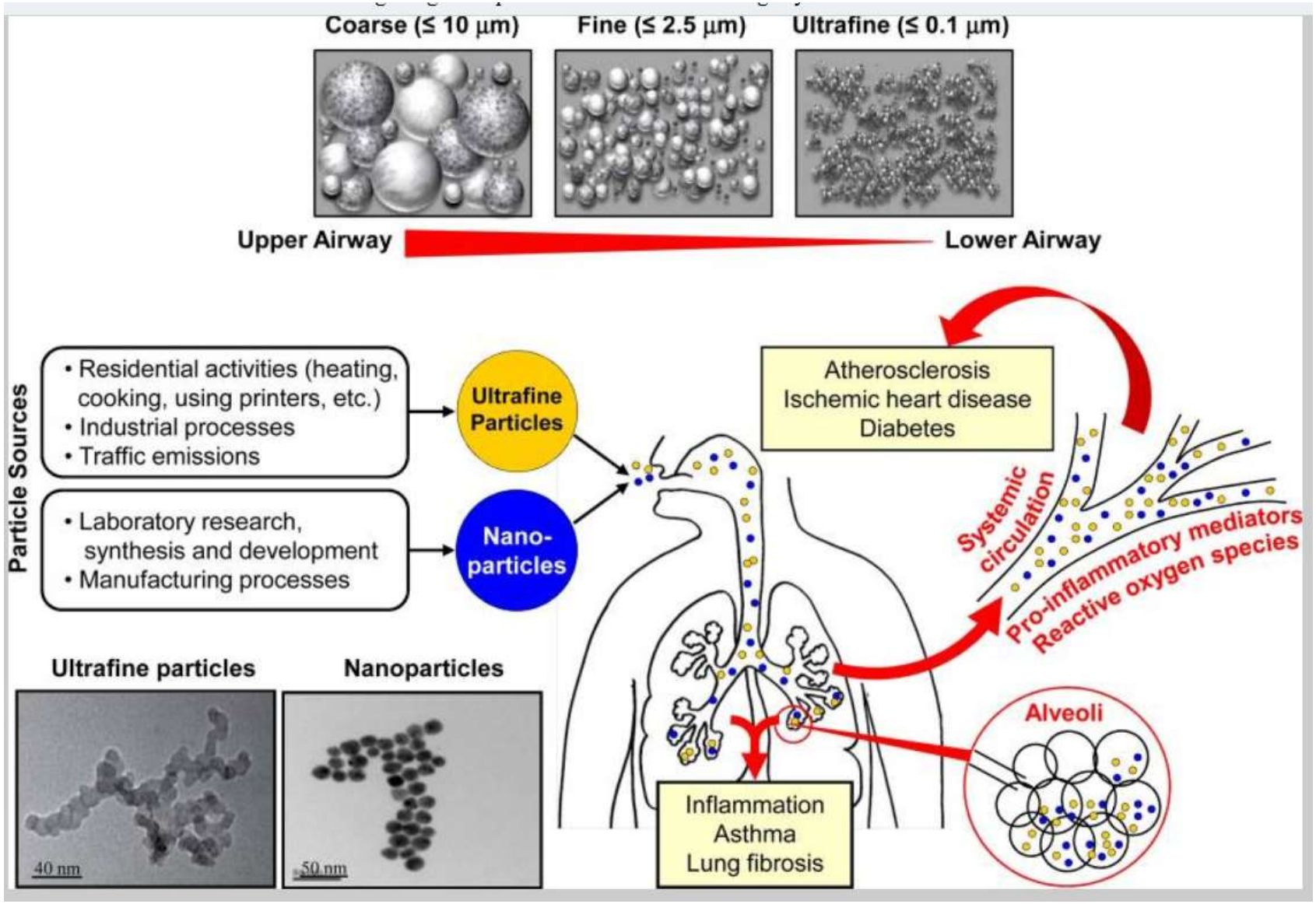
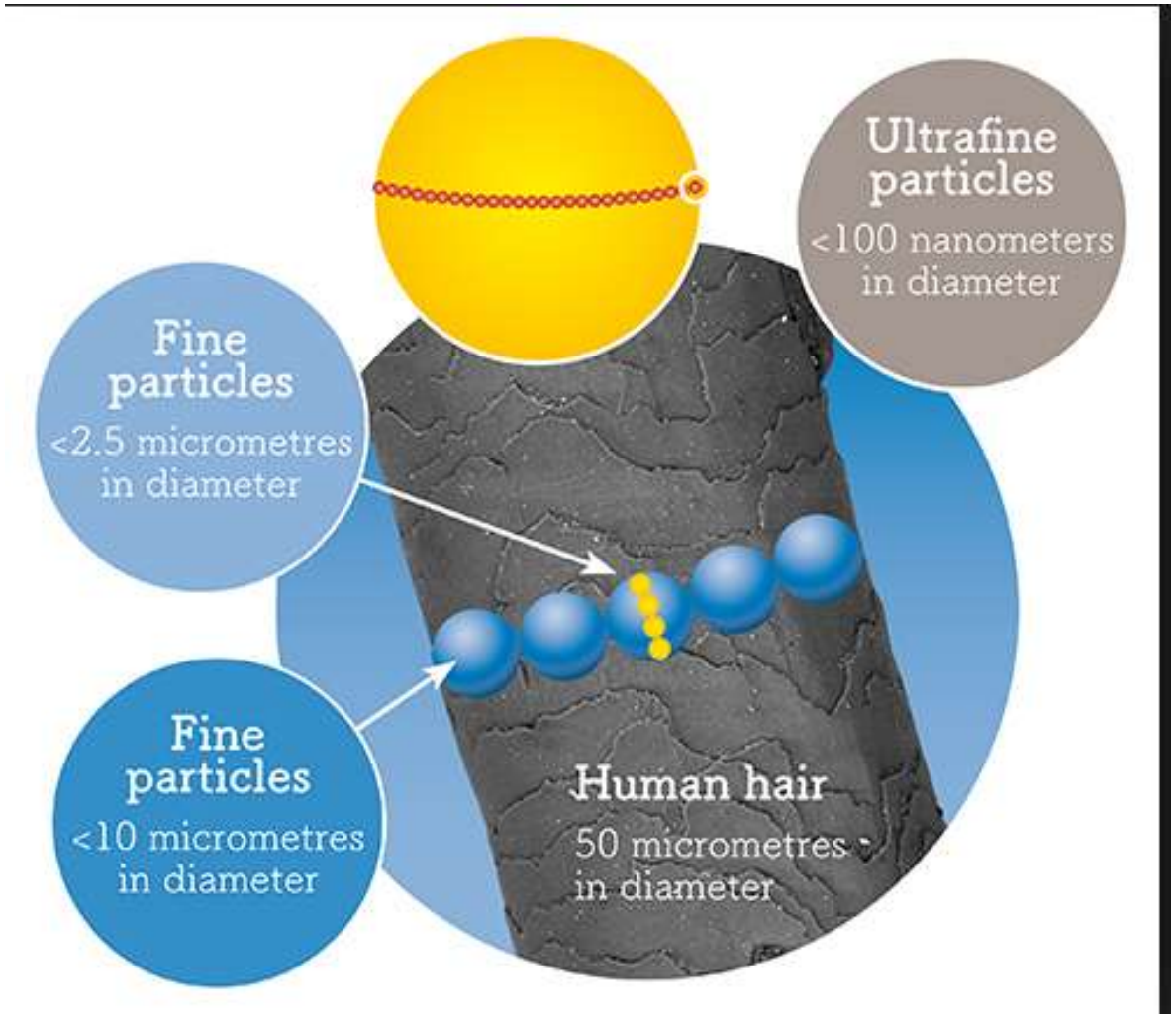


https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4976002/pdf/nihms774517.pdf

Ultrafine partikler < 100 nanometer



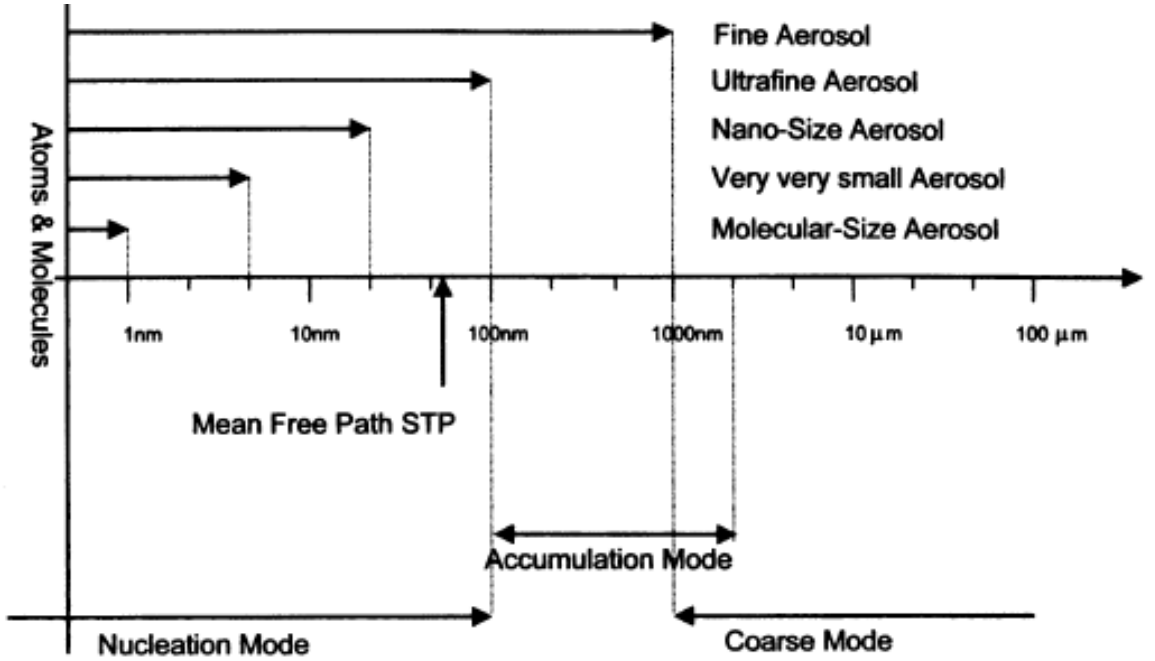


Figure 3.

The particle size classes: **coarse mode**, particles larger than about 1 µm mainly produced by diminution processes; **fine aerosol**, particles smaller than about 1 µm mainly built up by nucleation, condensation and coagulation; **nucleation mode** and **ultrafine aerosol**, particles smaller than about 100 nm; **nanosized aerosol**, particles smaller than about 20 nm; **very very small aerosol**, particles smaller than about 5 nm, particle behaviour dominated by surface effects, total number of molecules less than 500, **molecular size aerosol**, particles smaller than about 1 nm, less than 10 molecules in the particle. Reproduced from Preining (1998).

https://interestingengineering.com/dutch-group-creates-outdoor-vacuum-cleaner

Partikler og ultrafine partikler

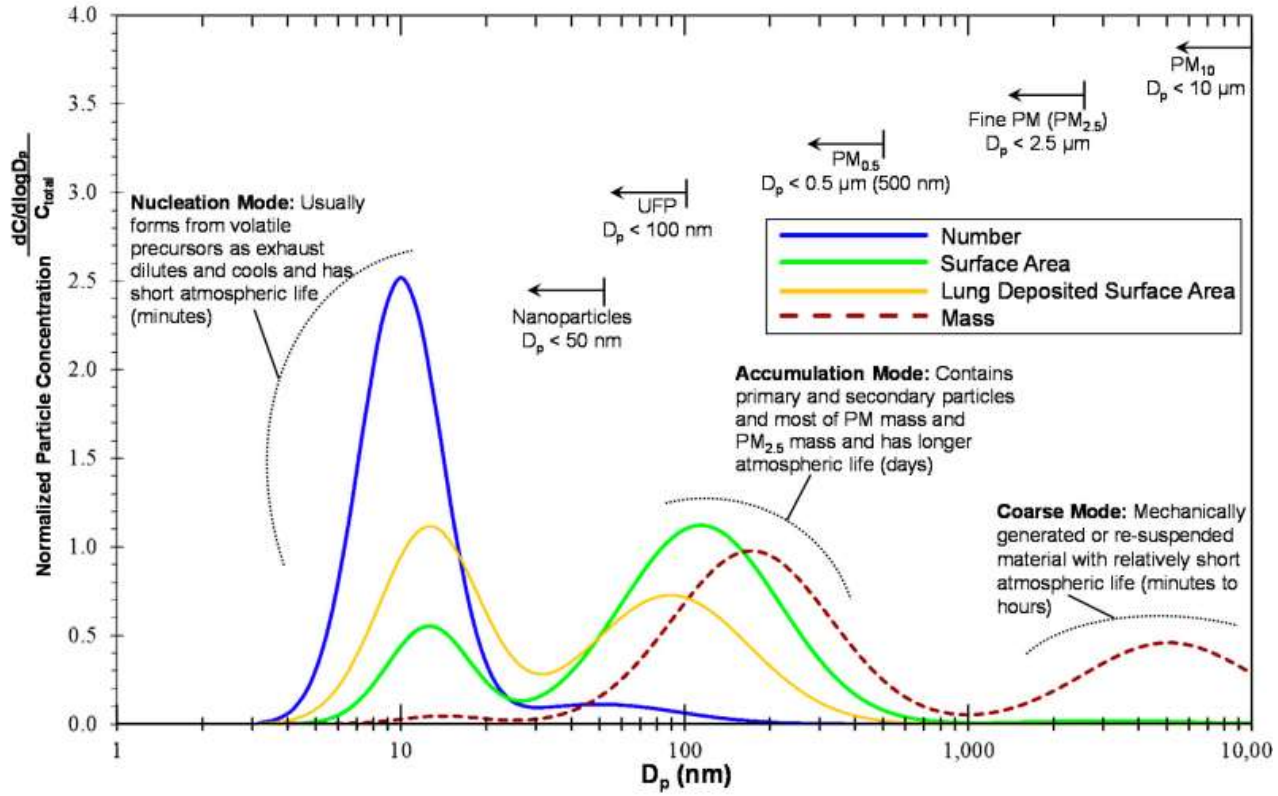
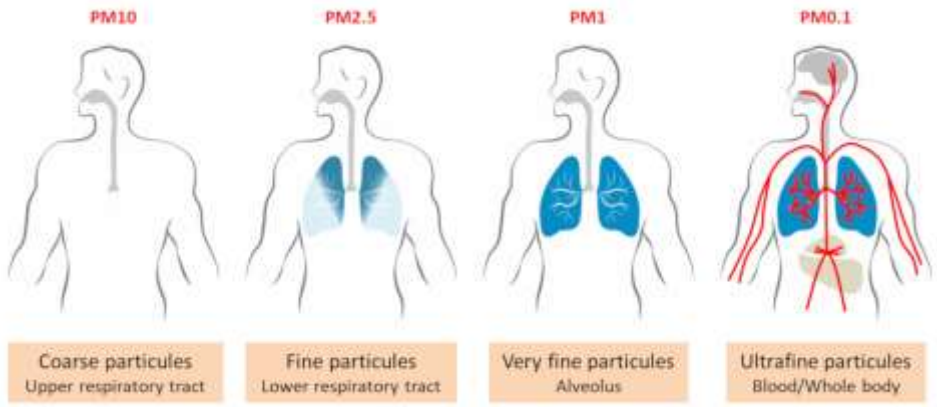


Figure 1. Tri-modal particle size distributions using different particle metrics (number, surface area, lung deposited surface area, and mass). For this figure, D_p is the particle diameter, UFP are ultrafine particles, and PM stands for particulate matter.



https://www.encyclopedie-environnement.org/en/health/airborne-particulate-health-effects/

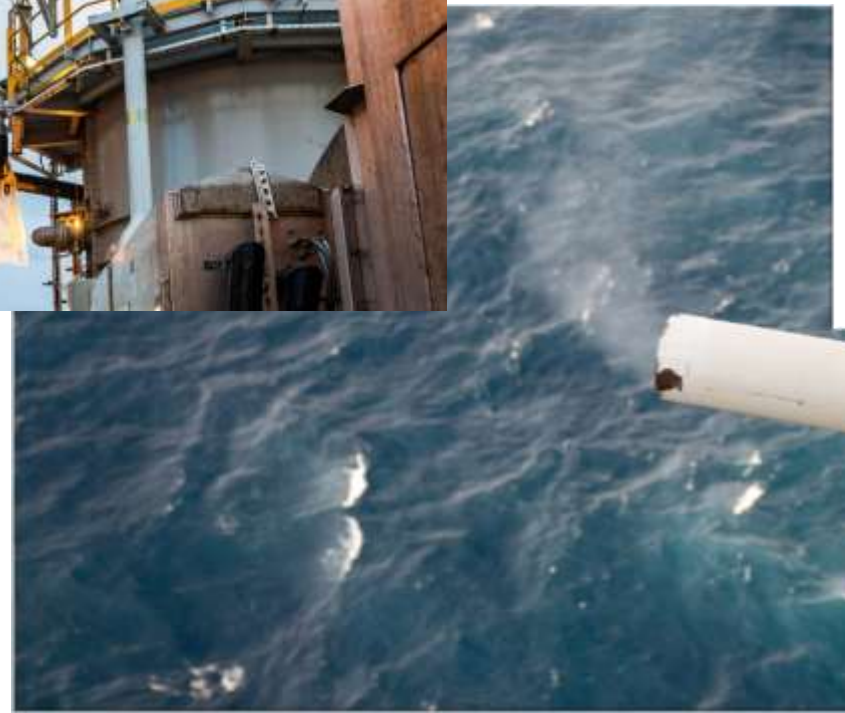
Conference Report

Ultrafine Particle Metrics and Research Considerations: Review of the 2015 UFP Workshop

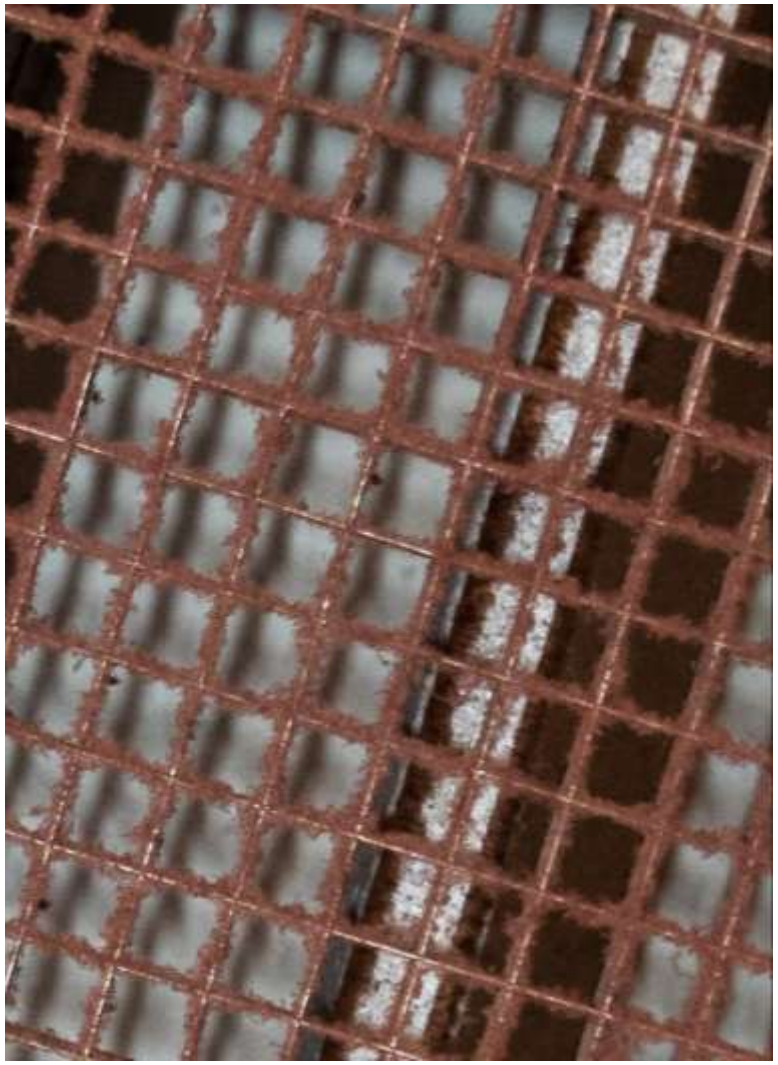
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5129264/


EKSOS

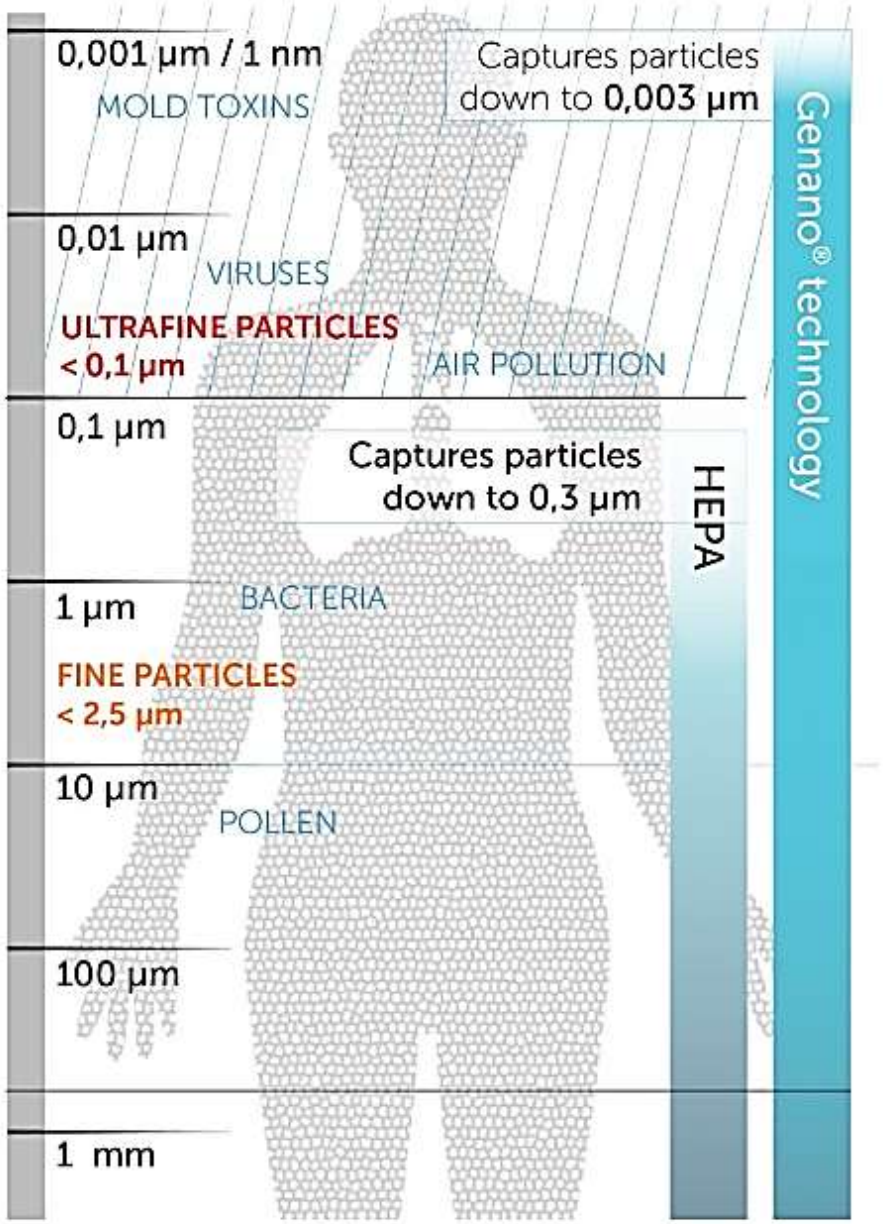
EKSOS og avlufting



Ultrafine partikler kan ikke fjernes med mekanisk filtrering



Genano Air Purification Technology



HEPA filter renser ikke luften for ultrafine partikler!

When HEPA Is Not Enough

The biggest health risk in the air we breathe is related to ultrafine particles and hazardous gases. These substances are able to penetrate to the bloodstream through alveoles in our lungs. The smaller the particle, the deeper it will be able to penetrate in our lungs. These kinds of impurities are, for example, mold toxins and particles from polluted outdoor air.

Removing them is not possible with traditional HEPA filters.

Genano's core advantage is the unique air purification method that can eliminate microbes and remove particles down to nanosize.

The technology has been scientifically tested down to 3 nanometer size particles (PM 0.003) – Genano Technology removes 99.5 % of even the smallest of the particles. Compared to standard HEPA filters, Genano's purification performance is a 100 times better in terms of particle size. In addition, Genano also eliminates the microbes instead of just collecting them.

Particle removal efficiency is often a misleading parameter when comparing air purifiers. **Think which is more important – to remove 0,3 micron particles with 99,99 % efficiency – or to remove 0,003 micron particles with 99,5 % efficiency?**

http://genano.com/products-and-support/air-purification-technology/

Rensing av luft med ultrafine partikler

genano

Genano® 525

High-performance, versatile air decontaminator unit for large and demanding spaces. It is suitable f. ex. for schools or other public spaces because the machine has a weekly-program which manages the power changes automatically.

Technical information	Genano® 525
Cleaning capacity	max. 500 m³/h
Particle size arrestance	> 0,003 µm
Cleaning efficiency	99,5 %
Gas removal	Included: 800 g activated carbon, 60 mm
Dimensions (W x H x D)	600 x 1630 x 600 mm
Weight	91 kg
Chassis	Painted galvanized steel
Installation	Mobile
Fan speed	Stepless speed control
Power consumption	60–130 W
Sound level	25–44 dBa
Operating voltage	198–264 V, 50/60 Hz
Usage temperature	+5...+60 °C

https://www.youtube.com/watch?v=vQ-gExn9Gqc

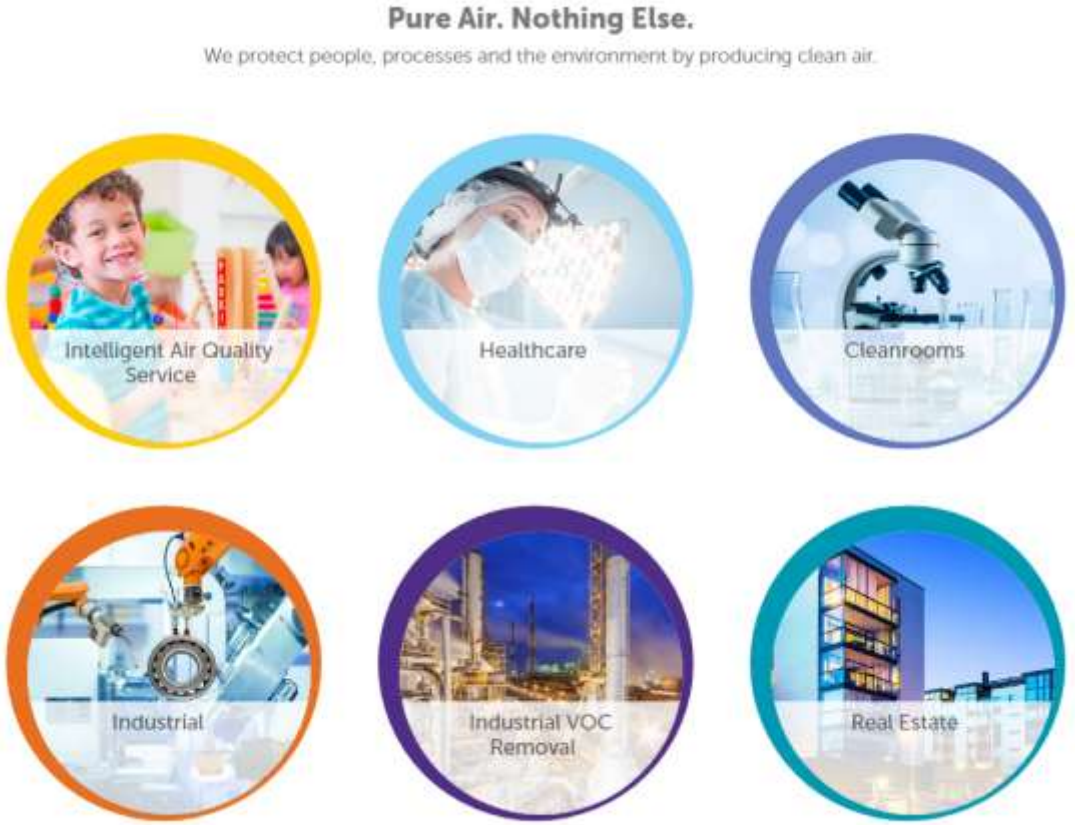
Read more about our services and solutions **genano.com**

Ny teknologi

Foto: Halvor Erikstein

https://safe.no/wp-content/uploads/2019/06/Removing-of-ultrafine-particles-Genano.-Peter-Christiansen.pdf

Genano har ny teknologi som helt sikkert kan anvendes i Norge



https://www.genano.com/

Ny teknologi for monitorering som jeg tror vil bli svært nyttig

Ny teknologi

https://safe.no/wp-content/uploads/2019/06/RUBIX-SAFE-12-06-2019-L.pdf

Foto: Halvor Eriksteln

Halvor Erikstein
organisasjonssekretær
yrkeshygieniker SYH
SAFE www.safe.no

SAFE HMS-konferanse
FULLT FORSVARLIG
Quality Hotel Residence, Sandnes
12.-13. juni 2019

Her er lenker "Fullt forsvarlig" hvor ultrafine partikler, ny teknologi og oppfølging av yrkessykdom var hovedtema

ETTERPÅ:

Bakgrunn for konferansen

Resolusjoner SAFE kongressen 2017

Programmet

Bilder fra konferansen med lenker til presentasjonene

De lange sakene

Lenker til tidligere SAFE HMS konferanser

Stavanger 5. juli 2019

https://safe.no/presentasjonene-fra-safe-hms-konferanse/

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Foto: Halvor Erikstein