

JOA – JAA; Acoustic Filters for sub-micron aerosols

With over 20 years of experience in design, manufacturing and installation of balanced vapor extraction systems, JOA is replacing fibre-bed filters (based on Brownian Diffusion) and scrubbers, with an innovative solution for efficient removal of sub-micron aerosols. This new solution combines the principle of acoustic agglomeration and advanced surface tension based coalescing. This eliminates the production of scrubbing (waste) water and reduces the system energy footprint by two thirds.

JAA – JHF: a twostep integrated solution

Many production processes (e.g. combustion, spraying, atomizing, steel-melting) produce sub-micron aerosols ('particles' < 1 micron). These particles have very small mass and momentum and therefore behave like gas molecules. This behavior and the small particle size, represents a serious health risk and has as well a negative impact on the environment.



In a two-step acoustic energy and coalescing process, the sub-micron aerosols are first preconditioned for effective elimination in the second step.

Agglomerates of the small (sub-micron) particles are formed in a specially designed (high degree of homogeneity) acoustic agglomeration chamber **JAA**. The larger agglomerates are filtered out and / or coalesced in

the second stage with the coalescer belt filter **JHF**. In the JAA agglomeration chamber a number of stepped-plate transducers (picture left column) effectively generate a high-intensity acoustic field (21 kHz frequency), reducing 0.3-micron aerosols by ca. 90%, thereby mainly generating 2-3 micron agglomerates. The operating principle is the relative motion between the particles of different sizes, referred to as the orthokinetic effect.

Productizing an engineered solution

In close cooperation with Pusonics (Madrid), JOA has designed and productized an integrated solution for industrial vapor and fine dust removal.



Standardized systems based on the Pusonics (Madrid) high power stepped-radiation-plate transducers (excellent directional control) are designed and engineered. This allowed successful operation of high-end extraction systems in a process exhaust air capacity range from 10.000-50.000 m³/hr.



SUSTAINABLE SOLUTIONS

The systems can be designed for integrated fine dust removal or vapor extraction. For fine dust removal JOA applies a range of high end conventional filters placed after the acoustic agglomeration chamber. For the separation of condensation cores and fine liquid aerosols, the JOA coalescer belt filter (JHF) is utilized.

For more details on the JHF coalescer belt filter, please refer to the JOA High efficiency belt Filter brochure.



Disruptive, Clean and Digital

Since 2000 the cost for sensors has reduced by a factor 4, data handling/storage/bandwidth by a factor 10, allowing for Advanced Analytics and Machine Learning, to fine tune this clean innovative technology even further.

This technology contributes to the environmental sustainability of production processes by reducing waste water streams and energy footprint.

This differentiating technology, is made available in a modular, scalable set-up, for industrial applications. To determine the suitability of the technology for your application, JOA has test facilities available in our Delft headquarters.

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