



Lube Oil Vent Mist Eliminator



## Lube oil vent Mist Eliminator

Air Water Soil Corporation offers a full range of air pollution control technologies, waste and primary water treatments and industrial fluids purification systems.

The “fluids purification system division” is specialized in the design of mist eliminators, liquid-liquid separators, coalescers, solid-liquid separators, static mixers.



*Filtering candle for turbines*



*Lube oil mist eliminator for compressors*

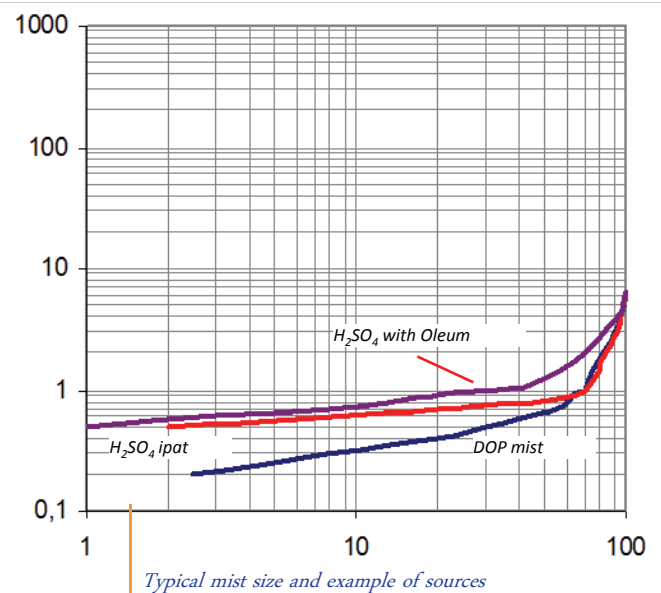
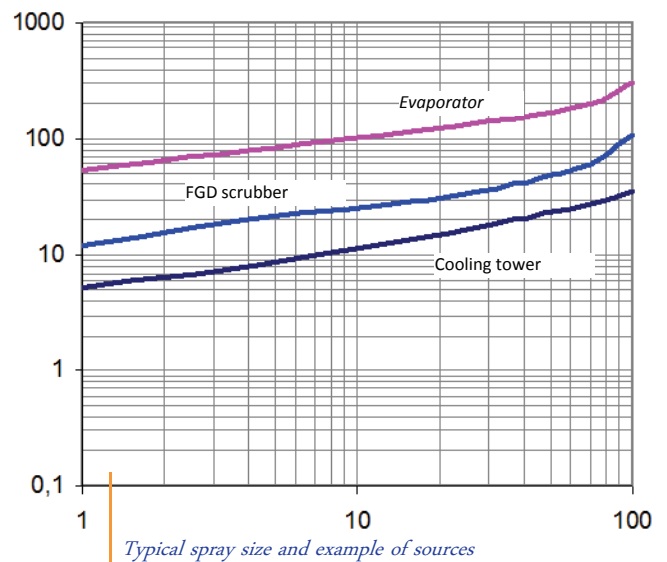


### Definitions: Mist and Spray

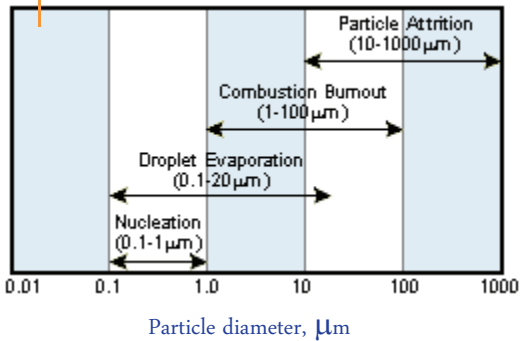
Aerosol applies to suspended particulate, either solid or liquid, which is slow to settle by gravity and to particles from the submicrometer range up to 10 to 20  $\mu\text{m}$ .

Mists are fine suspended liquid dispersions usually resulting from condensation and ranging upward in particle size from around 0,1  $\mu\text{m}$ .

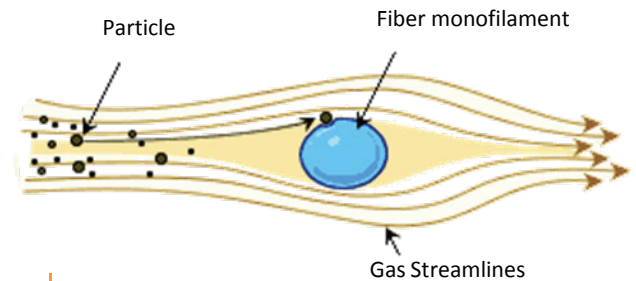
Spray refers to entrained liquid droplets. The droplets may be entrained from atomizing process (i.e. absorption towers). Size will range from the finest 10  $\mu\text{m}$  up to a particle whose terminal settling velocity is equal to the entraining gas velocity (if some settling volume is provided).



Particle size ranges for formation mechanisms



Particles between 1 and 3 micron are collected by direct interception. They are light enough to follow the deflected gas streamline but, when they pass close enough to a fiber, they are also light enough to be attracted to it by weak interactive forces and are once again collected. A particle of diameter 1.0 micron, for instance, is collected if it passes at a distance less than 0.5 micron from a fiber.



Interception

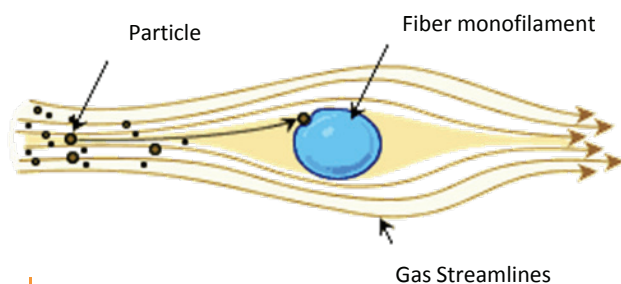
### Collection mechanism of LUBE OIL VENT

The initial object of any device for separating entrained mist from a process gas stream is to make the individual particles coalesce into a continuous liquid film on a solid surface from which it can drain away.

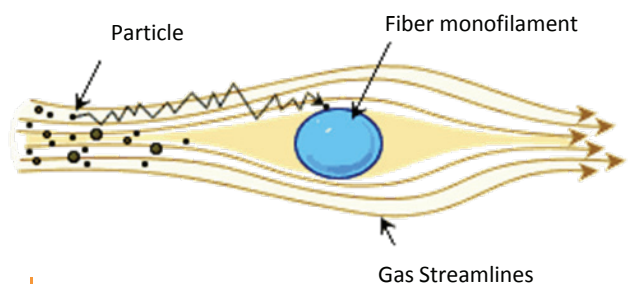
There are several mechanisms by which, alone or in combination, according to the nature of mist involved, this can take place. They include inertial impaction, direct interception, Brownian movement and electrostatic attraction.

Particles larger than 3 micron are relatively massive, and advantage can be taken of their momentum to collect them by inertial impaction. When the gas stream encounters an obstruction such as a fiber, its path or "streamline" is deflected round the obstruction, but the momentum of the 3+ micron particles carries them onwards so that they collide with the fiber and are collected.

Extremely fine liquid or solid particles (less than 1.0 micron in diameter) are small enough to exhibit random Brownian movement caused by collision with gas molecules. This random movement causes the particles to be displaced in any direction while following the gas flow thus increasing the probability to collide and be captured by the fiber. Brownian movement increases as the particle size decreases: thus a 0.1 micron particle will have about five times the Brownian movement of a 1.0 micron particle, greatly increasing the probability of collision with a fiber monofilament and of being captured.



Inertial impaction



Brownian diffusion

## LUBE OIL VENT MIST ELIMINATOR FOR LUBRICATED COMPRESSORS

### Purpose

The LOV of AWS Corporation was designed to remove oil mist originated in the lubricating systems of compressors. The principle of performance is based on brownian diffusion which, as widely described in our bulletin named FIBERWIND™ MIST ELIMINATORS, is higher when mist particles are smaller, i.e. their real size is below 1 micron. Usually the particle size distribution in lube oil mist applications is in the range of 0.1-0.5 micron. The LOV from AWS is well tested and reliable and guarantees the following :

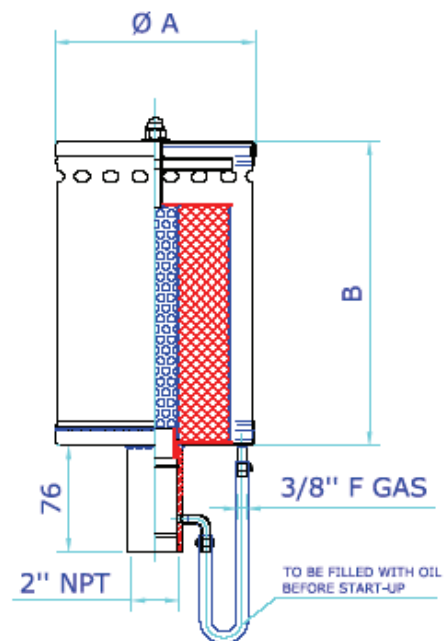
- No visible plume
- Constant and very low pressure drop
- Recover expensive oil
- Prevents seal leakage
- Easy operation and change over
- Economic in price



*Lube mist eliminator for compressors*

### Features

- Tailor made
- Compact design
- Removes all particles smaller than 1 micron in diameter
- Coalescing medium is made of special totally inert glass fibres
- Casing in carbon steel or stainless steel for special corrosive applications
- Differential pressure when oil saturated:  
< 2 mBar



Mod.Number	Flow rate	$\phi A$	B
VOF 3.5	3.5 Am <sup>3</sup> /h	254	390
VOF 8.6	8.6 Am <sup>3</sup> /h	254	490
VOF 14.5	14.5 Am <sup>3</sup> /h	254	720

The engineering of all mist eliminators is based on the experience and expertise of senior process and project people who served the centrifugal compressors market for several years.

## OIL MIST ELIMINATOR FOR GAS AND STEAM TURBINES LUBE OIL TANK VENT

AWS can contribute to the solution of many pollution control problems caused by oil mist.

The lubricated rotating parts of all gas and steam turbines, turbo compressors and vacuum pumps generate a visible oil plume which is to be removed from the air vented to atmosphere.

The installation of a simple but very effective mist eliminator on the lube oil vent solves the pollution problem and, by recovering the expensive oil, pays off the mist eliminator cost in a short period of time.

### AWS Mist Eliminator Features

The core part of our filter is the special inert glass fiber which is densely packed inside two concentric metal screens.

The peculiarity of the fibers and their specific density are responsible for a removal efficiency of up to 99.99% for all particles down to 0.1 micron.

Measurements made on installed mist eliminators have demonstrated residual oil mist contents far below 5 mg/m<sup>3</sup> in the air being vented to atmosphere.

On top of the extremely high efficiency, the AWS mist eliminator can combine a very low pressure drop which remains constant with time and a maintenance free operating life of several years. The collected oil mist is continuously discharged from the filter and recirculated back to the lube oil tank.

The pressure drop of the coalescing mist eliminator of AWS is very low, usually in the range of a few mbar which can avoid the installation of a sucking blower downstream of the mist eliminator.

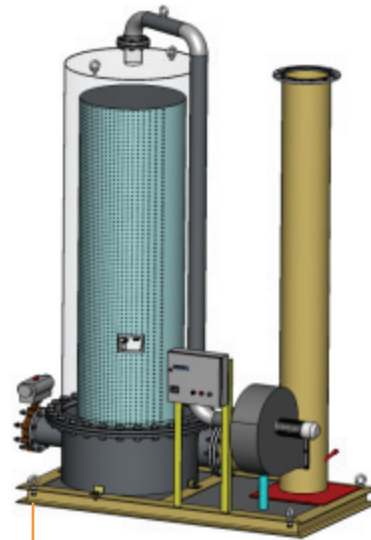
Virtually, the mist eliminator can be sized to achieve a very minimum pressure drop according to customer's request. The lower the requested pressure drop requirements, the larger will be the installed coalescing area.

### Equipment supply and installation

AWS has a production facility in Northern Italy.

AWS can supply the simple mist eliminator or, according to customer's requirements, a skid mounted unit which includes by-pass pipe, control valves, instrumentation, blower and motor.

For installations where room availability is a problem, AWS can provide tailor made solutions.



*Oil Mist Eliminator for turbines*



*Oil Mist Eliminator for turbines*



*Filtering canisters for turbines*



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