Mist Eliminator Performance

CECO Filters

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Wire mesh mist eliminators have been used to remove entrained droplets from a vapor stream since the late 1940's. Droplets collide on wire surfaces and coalesce together to form larger droplets which then drain to the bottom of the pad and rain off. Both the mist eliminator Capacity and Efficiency are considered in mist eliminator design.

Mist Eliminator Capacity:

The capacity of a mist eliminator is given by the equation:

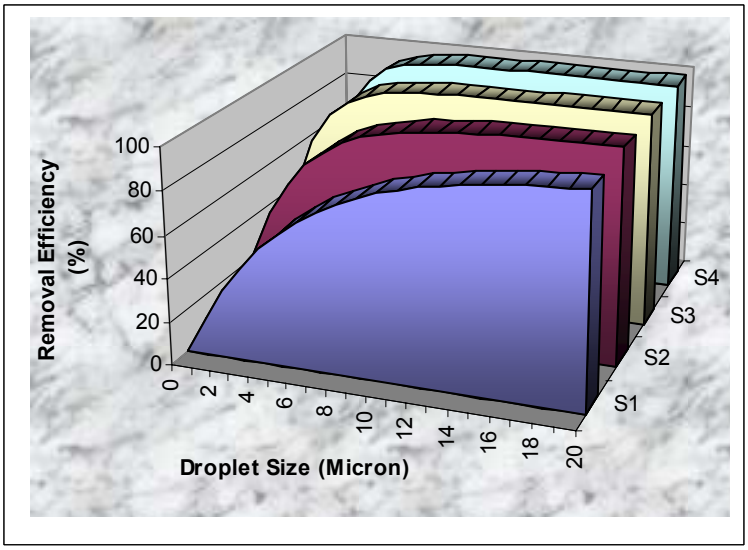
$$V = K\sqrt{\frac{\rho_L - \rho_G}{\rho_G}}$$

Where V is the maximum design velocity, K is a factor dependant on many factors such as mist eliminator orientation, mist eliminator internal structure, gas and liquid physical properties, and other specific operational parameters.
The higher the "K factor" the higher the maximum design velocity. Typical "K factor" values for mesh style mist eliminators range between 2.5 – 4.0 ft/sec.
Also, you can see from the right side of the above equation that the larger the difference between the liquid density and the gas density, the higher the capacity of the mist eliminator. The most common significance of this is that mist eliminators operating under vacuum or near atmospheric pressure have a significantly higher capacity than those operating under pressure.

Mist Eliminator Collection Efficiency

In the graph shown compares the removal efficiency in a natural gas application at 350 psia. The higher the specific surface area, the better the performance. This effect is accentuated at elevated pressures. At 950 psia, standard 9-lb density mesh removes 99.9% or droplets only at 26µm, where as 12-lb density mesh style 200 (with 0.006" wire) achieves this at only 9-10µm.

Removal efficiency is affected by the diameter of wire used and the specific surface area, or *target density,* or mesh. CECO Filters' designs correspond not to mass density of mesh, but rather to specific surface area of wire in the mesh.



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