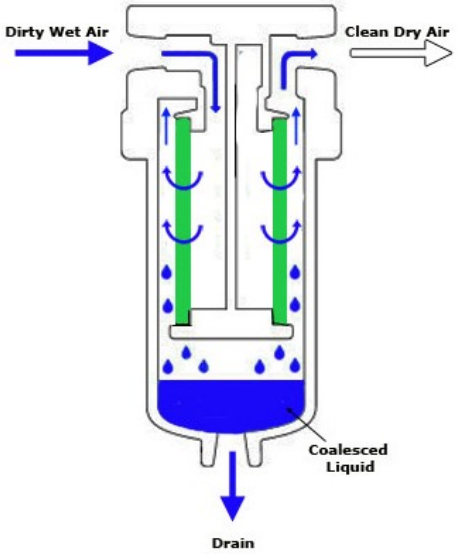
How Coalescing Filtration Works

Details

- Low Cost
- High Efficiency
- Low Pressure Drop (ΔP)

Set-Up



Borosilicate glass microfibers are considered to be the ideal filter media available for the coalescing of liquid aerosols. This material is neither liquid adsorbent nor absorbent and consequently, is superior for retaining its original properties while in service. Borosilicate glass microfibers are quite hydrophobic (water repellent) and water tends to form on such fibers in droplet form rather than as a film, a condition which is favorable to continuous filtration efficiency.

Our C- type coalescing element is constructed with an inner capture layer and outer drainage layer. As the wet gas stream enters the center of the element, the aerosol droplets get caught within the tightly wound "capture" layer. They grow in size and move into the intersecting fibers of the drainage layer. The large pores of the outer layer allow the droplets to fall off by gravity into the base of the bowl where they are collected and removed.

In heavily contaminated systems, we recommend that coalescing filters be protected by a 3 micron pleated element to so that they do not become choked off with dirt and lose their ability to coalesce liquid. We offer various pleated elements across our range to accomplish this.

The filter housing must be piped so that the gas stream enters port 2 (deep port) and exits port 1 (shallow port) so that the captured liquid can pass through the element (coalesce) and drop into the drain. Do not pipe backwards or the coalesced liquid will pass back into the system. Liquid collected in the filter bowl can be removed by a manual or fully automatic drain.

The coalescing filters are designed to have an initial dry pressure drop of less than 2 psi. Thereafter the pressure drop will increase very slowly as solid particles are captured and retained in the captured-layer of the element. UFS recommends changing the filter element when the pressure drop reaches 10 psi. The optional differential pressure indicator will give a visual warning of the need to change the filter element.

Metallic, plastic, paper (pleated), and baffle units do not exhibit the same natural properties as borosilicate glass microfibers, i.e. metallic and plastic elements do not have fibers to turn liquid contamination into droplet form. A film builds up on these elements, thus increasing Δp and reducing long-term efficiency. Paper elements have fibers but tend to retain the water droplets like a sponge and there again, Δp increases and reduces long-term efficiency. Baffles are fairly efficient at removing bulk contamination. Unfortunately, most contamination in compressed air lines is in the form of fine mist.